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The OIL WEEKLY

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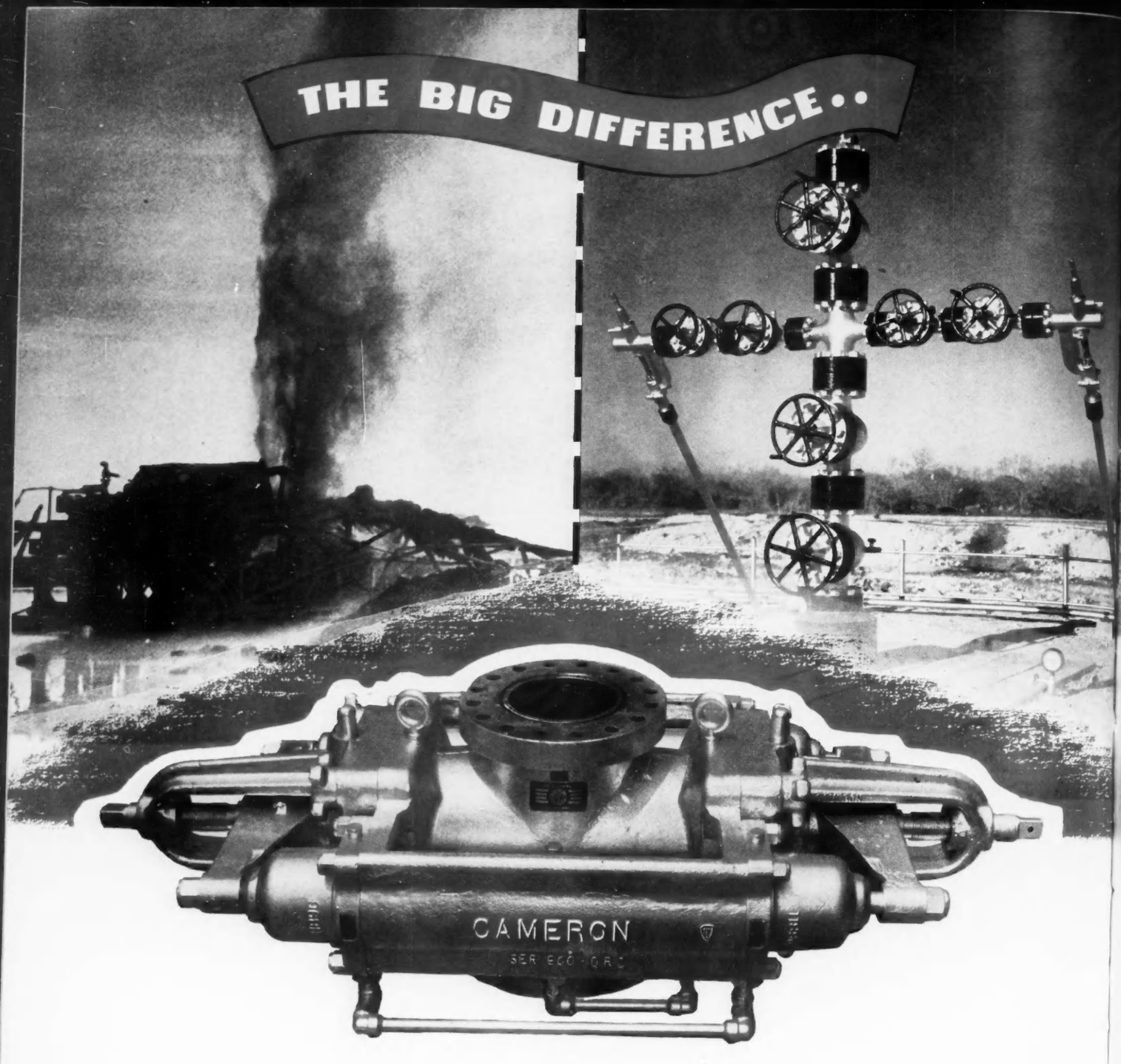

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Looking Ahead

WITH THE EDITOR

THE WORLD OIL ATLAS, an annual section of THE OIL WEEKLY containing authoritative maps and statistical data on the oil industry's world-wide activities, will be released with the May 20 issue.

THE WORLD OIL ATLAS

Publication of this 320-page international number climaxes a year's work on the part of THE OIL WEEKLY editors. Many of the countries involved were visited by staff writers; public and private sources of information were contacted personally or by mail.

The WORLD OIL ATLAS will contain 71 four-color, full-page map plates showing political subdivisions of areas where oil is being produced or actively sought, oil fields, pipe lines, refineries, etc. Data pages contain the latest available information on the oil producing nations of the world. Much other general information is presented.

Because world-wide activities of the oil industry will annually increase in importance, THE OIL WEEKLY editors already are gathering data for the 1947 issue of the WORLD OIL ATLAS.

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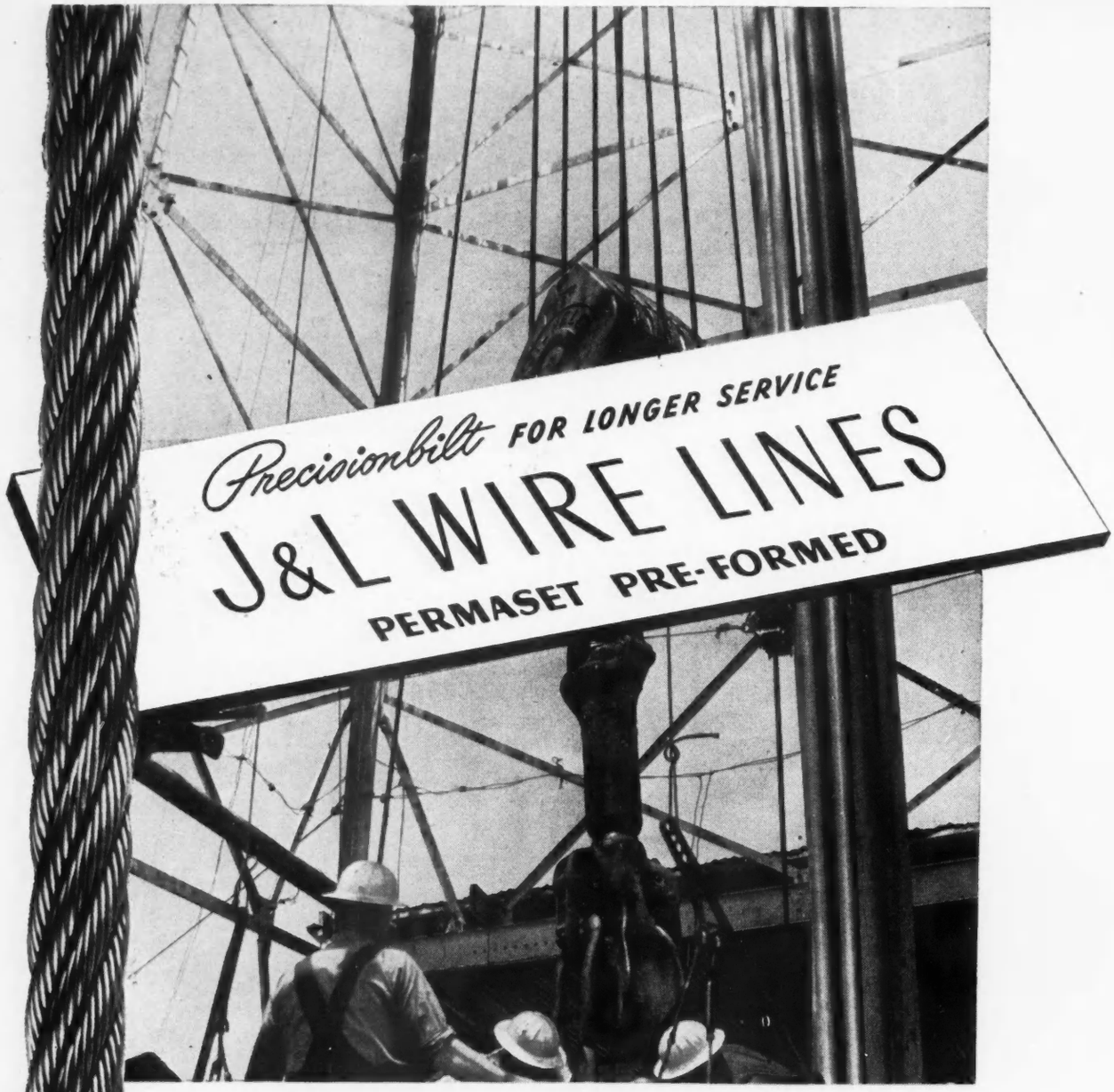

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Full Price Decontrol Aim of Oil Industry

WHILE the OPA continues discussions with oil industry representatives regarding the means and procedure for altering oil price controls, OPA spokesmen have equivocally promised complete price decontrol by June 30.

For the sake of the best interests of the public, it behooves the industry to think and discuss in terms of nothing short of absolute decontrol. The only question should be not whether there will be complete decontrol but how soon and why not sooner.

The arguments that oil price controls should not be completely eliminated but only modified or tentatively or partly lifted are based on unproved and uncertain theories about the bugaboo, inflation. The argument that the oil price controls should be eliminated is based on something real, understandable, and proved: To assure an adequate supply of oils to meet the needs of all kinds of buyers of all kinds of oils, wether gasoline, kerosine, or fuel oil.

Under the domination of "economic planners," price has lost its whole function and justification, to present the spectacle in which the tail seeks to wag the dog. The function of price, as any real economist will attest, is to draw forth adequate production to satisfy consumption. The oil industry is nearly a hundred years old, and price has always successfully performed that normal and desirable function.

Under arbitrary, government price fixation, this supply-demand mechanism has been thrown out of order. Price does not perform its function. With fixed price as the starting point, fixed production prevails without regard to wether or not it equals demand. As of today, fixed prices for fuel oils are bringing forth some production but not enough to meet demand. Tomorrow, it may be gasoline or lubricating oil.

The consumer's real interest is in getting the petroleum products that he needs and wants and not in the exact price which the producer must have in order to supply his needs.

If he has any doubts how he will come out under the free play of competition among producers and refiners, they will be dispelled by checking the records. The industry has consistently increased its efficiency and lowered prices until its products are bought freely by the people in all income groups.

Recommendation

THE boss came back from a trip to Central America (see "Guatemala Plans Open Door Oil Policy, THE OIL WEEKLY May 6) and his first chore was to catch up on OIL WEEKLY reading by poring through back issues he had missed.

He hit G. M. Fitzgerald's series on "Effective Management," which started in the issue of April 22 and, he admitted right frankly, he almost decided to pass it up, because he, like most business men, long since became fed up on platitudinous advice.

But he dipped into it, perhaps as a matter of duty toward the magazine, and he had decided before finishing Part 1 to be on the lookout for Part 2. Last week's Part 3 on "Personnel Relations" *really* rang the bell and he thought readers of THE OIL WEEKLY should be directed to the series and told that it is worthy of a spot on the MUST list of every employer. "Management" down to and including foremen should not miss the sound, common sense discussion of current problems, he thought.

This week's installment (page 54) deals with "Wage and Salary Administration," and the final part, next week is on "Sensible Wage Incentives." The boss man hasn't seen these yet, but he's going to like them and recommend them just as highly as the three that have preceded.

Check to see if you don't agree.

Carter's Analyzer A Real Contribution

THE Carter Oil Company recently made an important contribution to the oil industry when it released the results of experiments in connection with its oil analyzer and made available to responsible operators, without cost, the specifications of this mechanical mathematical "robot" which can predict pool behavior for many years in advance. (THE OIL WEEKLY, May 6, 1946.)

Carter scientists, working in the Tulsa laboratories where the destructive proximity fuse—designated second only to the atomic bomb in its contribution toward the winning of the war—was developed, spent many years in the constructive task of developing the oil analyzer which is designed to assist in the proper operation of oil pools and the conservation of the nation's oil resources.

In explaining the method of operation a Carter scientist made it clear that the oil pool analyzer was no "miracle" machine. It can only function after all accumulated geological, geophysical and engineering data have been gathered and "fed" into the machine. The answer is in direct proportion to the amount of information which the operator of the oil pool analyzer is able to obtain.

The oil analyzer represents the expenditure of considerable sums and Carter could not have been criticized if it had chosen to license its use. However, recognizing the broader aspects involved, the company has made a grant of its development and asks only that the facilities of the machine be used extensively in the interest of better production methods and conservation. For this the company deserves commendation of the entire industry.

* * *

The economic aspect of the case for raising wages is, of course, only one part of it. A lot of old-fashioned politicking, with the sights set on the '46 '48 elections is also involved. —Business Week

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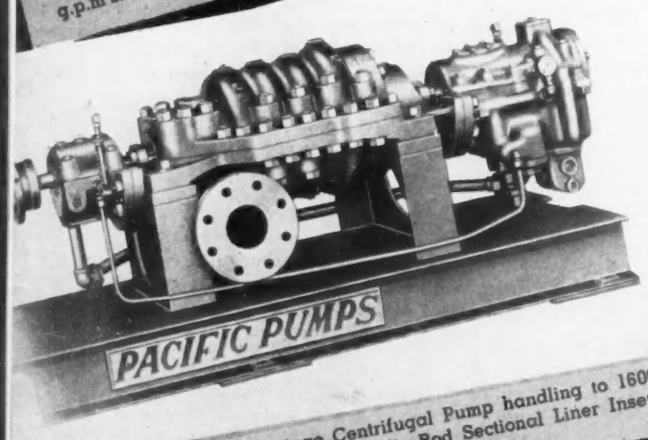

PACIFIC TYPE J B Multi-stage Centrifugal Pump handling to 1600 g.p.m's. at 500 degrees F. (Right) Pacific Rod Sectional Liner Insert Deep Oil Well Pump.

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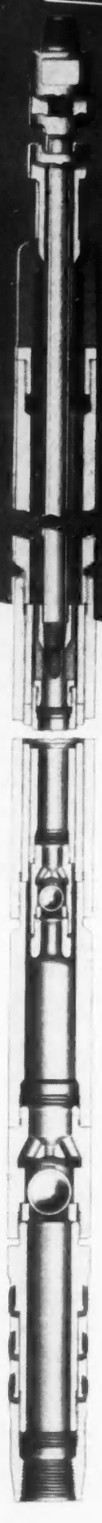

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PACIFIC *Engineered* PUMPS

The Week's News

INTERIOR Secretary J. A. Krug announced creation of an Oil and Gas Division within his department to coordinate all government oil activities, with an industry council patterned along the lines of the PIWC to be given an influential voice. Ralph K. Davies will remain in Washington temporarily to organize the division and the council, on which it is expected many members of the PIWC will serve. Page 27.

Boyd Given Medal—To William R. Boyd, Jr., chairman of the PIWC, went the medal for merit, the highest award to be conferred upon a civilian, with a citation by the President, for his outstanding service. Page 29.

Leasing Act Hearing—Revamping of the leasing act to eliminate sources of friction between the industry and the government and to make long-needed reforms was the subject of hearings before House and Senate Public Lands Committees, which will prepare legislation, with good possibilities of its enactment this year. Page 26.

Anglo-American Oil Pact—Interior Secretary Krug announced he will support the Anglo-American petroleum agreement, but left the impression he was uncertain of its adequacy in present form. The suggestion has been made elsewhere that the treaty be recalled from the Senate for a second time, to permit renegotiation as a multilateral agreement with Russia participating. Page 27.

Interior Funds Slashed—The House Appropriations Committee virtually halved the Interior's estimates of financial needs for the coming fiscal year. The department is looking to the Senate to restore at least a good part of the $72 million thus denied. Page 29.

Buying Commissions to End—The State Department has asked 15 foreign governments to terminate activities of buying missions in this country, to pave the way for restoration of private international trade. Page 28.

Coal Strike Effects—A six-weeks interruption of coal production left the country dangerously short of bituminous fuel, necessitating the imposition of freight embargoes and cuts in passenger transportation, leaving a rapidly growing list of stalled industries. Oil industry adversely affected. Coal miners ordered back to pits. Story below.

Decontrol Plans Delayed—The coal strike also has delayed OPA issuance of its decontrol order affecting industries and general lifting of price regulations. Page 26.

PIEA Convention—Houston gets the next convention of PIEA which was told at Tulsa how war development in communications would benefit oil. Page 28.

Stripper-Well Subsidy—Budget estimates for operation of the government corporations during the coming fiscal year make no provision for funds for the payment of oil subsidies and, barring action by Congress within the next six weeks, those payments will cease June 30.

Effects of Extended Coal Strike Show In Many Branches of the Oil Industry

The 40-day old coal strike has brought about a two-fold effect upon the oil industry—a serious shortage of oil field equipment and an increase in demand for residual fuel oil.

This appeared to stand despite John L. Lewis' May 10 order sending the miners back to the pits for 15 days for production that will be channeled almost entirely to public utilities and other essential activities.

On the same day, Acting Director Ralph K. Davies of the new Oil and Gas Division of the Department of Interior appealed to East Coast suppliers to set aside 75,000 barrels of residual fuel oil daily to enable public utilities to operate standby equipment, this upon request of CPA.

The shortage of steel, as a result of the recent strike in steel plants, has already placed a crimp in tubular goods and other oil field equipment, causing some rigs to be stacked. There is very little steel now being produced and manufacturers believe this small production will be halted completely by June 1 if the coal strike extends beyond that date.

The most serious threat to continued operations of rigs is the embargo placed on rail movement in car load lots. This means that oil field equipment, including pipe, cannot be moved from the manufacturing area of Youngstown, Ohio, and Pittsburgh, over railroads using coal for fuel. Supply companies in Houston say they have no stocks of oil field equipment. However, most of the active oil companies do have some stocks of equipment which were built up in anticipation of the coal and steel strikes.

Crude petroleum, petroleum coke, gasoline, fuel oil, kerosine, lubricating oils and greases, and liquefied petroleum gas were included by the Office of Defense Transportation in the list of commodities which might continue to move by rail without restriction.

Oil field equipment can be moved from the east by ships and barges but supply companies point out that there are few ships available, and steel plants cannot operate without coal.

Effect of the coal strike will be felt for many months. It is probable that wartime coal rationing, even if miners return to work soon, will be applied. This will bring about an increased demand of burning and heating oils, particularly the latter next winter.

Influence on Big-Inch

However, it is doubtful that the oil industry will be able to meet this increased demand for fuel oil as stocks of residual fuel oil now totals only about 40 million barrels, a minimum working level. Too, most of these stocks are located in California.

Observers in Washington predict that the coal strike would bring about a tremendous trend among industry and private consumers to convert their plants to oil or gas and would bring strong support from the East for conversion of the Big-Inch pipe lines to natural gas.

Meanwhile, several oil field equipment manufacturing plants in the East are shutting down. Spang Chalfant Division of The National Supply Company is shutting down all welding plants and considered it "a matter of days" before it would close its seamless pipe works. National Tube Company has closed its seamless mill at Ellwood City, Pa., keeping only a skeleton crew at the plant. Lucey Export Corporation's boiler plant at Chattanooga also closed.

Plants remaining in operation are reducing output. A. O. Smith Corporation announced that after May 9 no shipments would be made from its pipe works at Milwaukee. The backlog of all tubular goods is seriously short.

Practically none of the plants are taking any order for delivery earlier than next year and no deliveries are promised until then even on firm orders set up by schedules. In small run instances earlier deliveries are expected if mill overruns permit, but this type of relief is dwindling as plate rejections increase.

One company reports it is taking orders for oil well casing for delivery next January. Republic Steel Corporation discloses it is set back two months by the coal strike to date and its welded pipe program is thrown completely off schedule, with no prospects of any delivery this year. Lucey Export says its plants are unable to obtain delivery of casing or tubing this year. Continental Supply said it was forced to "let everything slide" and had been told some of its deliveries on seamless pipe might not come through until the "last quarter of 1947."

The steel plants were pessimistic of the outcome. United States Steel spokes-

men said that even if the strike ended immediately, three weeks would be required to bring ingot production to 80 percent or 90 percent of capacity. Carnegie-Illinois is operating at about 9 percent capacity and four other U. S. Steel plants are shut down.

OPA Order on Decontrol Delayed By Coal Strike

The coal strike has thoroughly fouled up OPA plans for decontrol of industries and make impossible for some time to come the general lifting of price regulation a spokesman for OPA revealed at the week-end. A major program for suspension of controls on oil-field equipment and other production machinery is included, as well as an order, ready for signature, suspending the ceiling on gasoline.

However, OPA said, if the strike continues they will look over this situation in a week or ten days and withdraw from the general machinery order and issue separately suspensions of price control on a few major items, one of the first to be selected being oil-production machinery. However, it was made clear, the OPA prefers to wipe out controls over a large segment of the machinery field at one time.

Notwithstanding the fact that the decontrol program is at a standstill, OPA is going ahead with the processing of industry-wide increases for petroleum production machinery, which may be adopted as an alternative to suspension pending the resumption of full-scale production.

In the case of gasoline, officials said they wanted to "take another look" at the suspension order in the light of current conditions, but indicated it would be issued as soon as it was demonstrated that the coal strike and its attendant difficulties would not reduce the availability of motor fuel.

It was made clear that oil industry price control will not be terminated at this time, but merely suspended.

Helium as Tracer Wins Award for Coscoe Cattell

Development of a method of using helium as a tracer gas to determine underground movements of gas and oil, last week won for Roscoe A. Cattell, chief of the Petroleum and Natural Gas Division of the Bureau of Mines, an award for outstanding achievement, which carries with it $1000 in cash.

An award of excellence, which also carries $1000 in cash was made to Ellis M. Frost, Jr., bureau chemical engineer at Amarillo, Texas, for an improved apparatus and procedure for determining helium in natural gas.

Helium which is declared to be better as a tracer gas than any other is now being tested out in Slaughter field, Texas, where four major companies are awaiting the outcome of the tests before making a decision to erect a $15 million repressuring plant.

Industry Gives Views on Leasing Act Before Senate Group; House Takes Over

Differences of opinion between Interior Department officials and the oil industry over the amendments to the leasing act to be written into legislation were aired last week at hearings before the Senate Public Lands Committee.

The major issues were the royalty rates, acreage limitations and options, assignments of leases and the right of the Secretary to fix the price of royalty oil where he was not satisfied with the market price, but there were many less important points which will have to be ironed out before the committee submits the legislation to the Senate.

Immediately upon completion of the Senate hearings a similar series opened before the House Public Lands Committee with the same witnesses scheduled to testify. The urgent recommendations of the industry for revision of the existing law were summed up by A. C. Mattei, president of Honolulu Oil Corporation as follows:

A flat 12½ percent royalty on all new discoveries; lifting of the acreage limitation to 15,360 acres in any one state; except from acreage limitations all competitive leases, leases which have been on production five years and leases subject to unitization plans; granting of geological or geophysical options without limit as to area; permit lease assignments to any qualified applicant by simple lease assignments to any qualified simple procedure; authorize the delegation to state agencies or other bodies of control over development and production under unit plans; permit wildcat drilling by two or more persons as tenants in common of a government lease without the present excessive acreage charge; and provide that only lands within known geological structures of producing fields be leased upon competitive bidding, rather than lands merely believed to be valuable for development.

Krug Is Witness

Secretary of the Interior J. A. Krug, declared at the hearing that he is as eager as anyone to further full development of our oil resources, asserted that the increase in royalty rates made effective by the leasing-law amendment of 1935 did not reduce prospecting operations, but admitted that there is considerable dissatisfaction over the operation of the present law.

Krug set forth the main tenets of departmental policy as the prevention of monopoly, the furtherance of conservation and obtaining a "fair and reasonable" revenue from the oil and gas deposits in national ownership.

Opposing the flat 12½ percent royalty rate for new discoveries, the secretary said the average royalty under the present sliding scale is only eight-tenths of one percent higher and there appeared to be nothing to gain by adopting the O'Mahoney recommendation. The real inducement for prospecting must be found in an active demand and a fair price for oil and gas, he thought.

Industry Spokesmen

Challenging the department's position on royalties, W. H. Ferguson, executive vice president of Continental Oil Company and one of several representatives of the Rocky Mountain Oil and Gas Association who testified, pointed out that more than 90 percent of all privately owned and most of the state lands are leased on a one-eighth royalty.

"If the real object is to promote exploratory wells in virgin territory or to test deeper sands, there is no apparent reason why the United States should demand a higher royalty on the public lands than is customary on private and state lands," he declared.

Ferguson also attacked the department's stand on acreage limitations, pointing out that Texas, the greatest producing state in the Union and which has no government lands, has no such restrictions.

The oil men took issue with both the 100,000 acres proposed in the bill and the 64,000 acres suggested by the department as the maximum for geophysical and geological examinations, and declared there should be no limit whatever.

All of the industry witnesses emphasized that lack of limitations on optioned acreage will in no way lead to the development of the department's bugaboo of monopoly, pointing out that in the event development is undertaken the acreage limitations on leases would immediately come into force.

No Acreage Change

Recommendations of the Interstate Compact Commission, in line with those of the industry, were laid before the committee by Warwick M. Downing of Denver.

At the close of the hearings it was apparent that many of the changes solicited by the industry would be incorporated in the legislation, but it was stated definitely by Chairman Carl A. Hatch of New Mexico that the committee would not undertake to eliminate acreage restrictions, incorporated in the original law as a safegard against monopoly, since the inclusion of any such provision would be a major handicap to passage of the bill.

Octane Rating Change

A recommendation for a cut of 1.5 points—from 80 to 78.5—in the octane rating of premium gasoline was submitted to the Civilian Production Administration last week by representatives of the refining industry as a means of conserving the dwindling lead supply. Such a move would involve no major changes in refinery practice.

Justice Studies Matter of Continuing PIWC Under Interior's New Setup

PAW passed out of existence as a war agency May 8, under an executive order signed by President Truman, but the government-industry partnership will be carried on by a new organization in the Interior Department announced by Secretary J. A. Krug.

Acting under instructions from the President to "take the initiative in obtaining coordination and unification of federal policy and administration with respect to the functions and activities relating to petroleum carried on by the various departments and agencies," Krug set up an oil and gas division, and announced that he would create an industry committee comparable with the wartime PIWC and, in fact, hoped that many of the war council members would serve on it.

Deputy Administrator Ralph K. Davies has agreed to remain with the government for a short period to set the new organization up. The permanent director of the division has not yet been selected, but the job is believed to be Davies' if he wants it. Some 25 persons remaining in PAW when it went out of business will work with Davies in developing the division, the backbone of which will be the petroleum conservation division of the department, which will be transferred intact to the new agency.

Functions of Division

The primary functions of the division will be:

1. To assist the secretary to execute the President's instructions to

(a) Coordinate and unify policy and administration in respect to the functions and activities relative to oil and gas carried on by the various federal agencies;

(b) Serve as the channel of communication between the government and the industry;

(c) Serve as the liaison agency of the government in its relations with the state oil and gas bodies; and

(d) Review technological developments in the field of petroleum and synthetic hydrocarbon fuels and coordinate federal policy with respect thereto.

2. Obtain and analyze information as to oil and gas matters in which the government has a "proper" interest and, in this connection, serve as the central federal clearing house for statistics, technical data and other information relating to oil and gas.

3. Keep the secretary informed with respect to the adequacy and availability of supplies of petroleum and its products to meet the current and future needs of the nation, and with respect to significant developments in the petroleum field, and make recommendations with respect thereto.

4. Develop proposals looking to the centralization of federal functions and activities relating to oil and gas.

5. Coordinate all oil and gas policies and activities in the Interior Department.

In his letter to Krug, instructing him to begin the coordination of federal oil activities, Truman paid high tribute to Davies' work, urging that he be retained to get the new activities under way.

Davies Praised

"Mr. Davies possesses a broad experience in oil, and enjoys a high standing both within government and within the petroleum industry," he said. "I believe that his participation would assure the full cooperation and support that is so essential in the initial phase."

The President, who got some experience in oil when his Senate committee investigated the Canol project during the war, instructed Krug to keep him advised of significant developments in order that any problems might be promptly dealt with.

"I need not emphasize to you the importance of petroleum in the life of the nation and the consequent necessity for assuring the adequate and continuous availability of this vital resource," he wrote. "You are requested to keep me informed concerning significant developments in the petroleum field, and to consider and recommend such steps as may be necessary appropriately to safeguard our petroleum future."

Krug disclosed that he already has asked the Department of Justice to give the necessary clearance for the proposed national petroleum council, and was told by Davies that it is possible the Attorney General would act within a week.

"I hope most of the same men (who served on PIWC) will serve on the new council and help in peacetime to carry out the magnificent job they did during the war," Krug said.

Krug emphasized that the new setup is "not any attempt of the federal government to regulate the petroleum industry, but merely an effort to make the various government relationships with the industry more effective and more practical, eliminating some of the duplications which prior to the war confused the government's relationship with the oil industry.

"PAW, under my predecessor and under Mr. Davies, did one of the great war jobs in Washington . . . The industry took on a tremendous program and met all war requirements."

The new agency will work closely with the State Department in international oil problems, the secretary said, "bringing to them complete information on the domestic situation," and will give the same service to the Army and Navy.

To Coordinate Bureaus

Krug said that this question of representation recently raised by the independents is one of the points in which the Department of Justice is very much interested and Davies promised that "certainly independents will have adequate representation" on the council. It was pointed out, there will be a number of subcommittees, on which the independents will have opportunity to serve.

While the new division will absorb the Petroleum Conservation Division and thereby become administrator of the Connally "hot" oil act, Krug said it would not take over the operating functions of the department, such as the Geological Survey, General Land Office or Bureau of Mines, although it "will make sure their relations with the industry are coordinated."

Davies said he had talked with a number of oilmen about the setup and while some are opposed to any centralization of the government's dealings with the industry "I feel quite confident that the overwhelming majority will support this plan, particularly since they will be such a vital part of it."

"One of my greatest regrets in seeing WPB liquidated," Krug interjected, "was that the industry advisory committees so helpful during the war were not retained by the permanent government agencies. In this case, we will have an opportunity to continue the wartime cooperative arrangement in the future."

In a formal statement noting the demise of PAW, Davies pointed out that the agency had carried out its promise to go out of business when its wartime job was finished. He urged the industry's cooperation with the new division.

Krug Doubts Adequacy of Pact

Secretary of the Interior J. A. Krug last week declared he would support the Anglo-American petroleum agreement when it is taken up by the Senate Foreign Relations Committee, but indicated doubt as to the adequacy of the instrument.

"I think the proposed treaty is a good first step," Krug said. "It provides the framework for working on international problems which should be helpful, but whether something more precise will be needed at a later date to protect our own country or carry the idea fruther I think experience will develop."

Krug said that he knew there was considerable opposition to the pact.

"Some opposition to the treaty is real, and maybe we haven't done a good job in explaining the agreement," he declared, suggesting that much of the opposition is founded on a misunderstanding that the agreement will do things which, in fact, it seeks to prevent, such as the formation of cartels.

Oil Industry Electrical Group Selects Callahan

M. C. Callahan, assistant general superintendent of the pipe line division, Gulf Refining Company, Tulsa, was elected president of the Petroleum Industry Electrical Association at the 18th annual meeting of the organization in Tulsa May 7-9. Callahan served as vice president of the association for the past two years.

Houston is the 1947 convention place and J. F. Collerain, Humble Pipe Line Company, Houston, will be general chairman for the meeting. Collerain, who has been secretary-treasurer of the association since 1938, was elected vice president.

R. C. Appling, United Gas Pipe Line Company, Shreveport, La., retiring president, was elected secretary-treasurer for the coming year.

Glen E. Nielsen, chief of the emergency and miscellaneous division, Federal Communications Commission, Washington, told the association that the FCC intended to assist the oil, gas and other industries in obtaining radio frequencies as soon as possible. A study is being made as to channel allotments and an announcement as to allocations will be made soon.

Nielsen, discussing "Radio Facilities for the Petroleum Industry," said that war research had resulted in tremendous advances in the development of vacuum tubes and associated circuits. "These developments have resulted in extending the useful portion of the radio spectrum to such an extent that radio channels can now be made available for the establishment of many new radio services and the expansion of certain existing services," he declared.

Pipe line companies use radio communications today, but it is expected that production and exploration branches will expand their communications system to include radio facilities.

D. E. Noble, general manager, communications and electronics division, Galvin Manufacturing Corporation, Chicago, explained the range and application of mobile radio units, land stations and walkie-talkies in communications systems.

A display of electrical and communications equipment was on exhibit. Delegates were told that materials and labor shortages have delayed development of devices for the petroleum industry, but that the situation is rapidly improving.

P. H. Bohart, assistant to the vice president, Gulf Oil Corporation, Tulsa, speaking on "Oil and Tomorrow" at the annual banquet, called on the electrical men of the oil industry to help locate hidden oil pools in this country in an attempt to offset our declining reserves.

The Petroleum Equipment Supply Association, meeting with the PIEA, elected Fred Cummings, Graybar Electric Company, Tulsa, president for the coming year; E. C. Lyle, Westinghouse Electric Company, Houston, vice president; and R. A. Breese, General Electric Company, Dallas, secretary-treasurer.

Carthage Field Output Registers a New High

Natural gas production in the Carthage field, Panola County sector of East Texas, has increased to a new peak of 241,154,000 feet daily, according to a survey on April 1. The condensate output has been boosted to 3500 barrels daily.

Substantial gain in production will follow the completion of additional gas line outlets and field recycling plants, as 154 of the 274 completed gassers are capped for lack of a market.

Arkansas Line Planned

Root Refining Company is reported to be contemplating the construction of a 15-mile 6-inch crude line from the Wesson 13-well field, Ouachita County, Arkansas to the Shuler field, where connection will be made with carrier that serves its El Dorado refinery.

Market Outlet Announced For the Baxterville Field

Gulf Refining Company, pipe line division, is credited with planning to provide a market outlet for the capped 16-17-gravity producers in the Baxterville field, centering upon Marion and Lamar counties, Mississippi, by constructing a 11-mile, 14-inch discharge line to a tank car rack site on the Southern Railroad at Lumberton.

The field has 19 producers, including gas-distillate wells whose output is trucked to Lumberton, then moved by tank cars on consignment to Standard Oil Company of New Jersey's Baton Rouge plant. Gulf's project includes two 10,000-barrel stock tanks in the field and four 55,000-barrel tanks at the rack site.

Premier Buys Lines

Premier Oil Refining Company, owner of a refinery at Fort Worth, has purchased the Texas Pacific Coal & Oil Company's crude lines in the West Central Texas district for approximately $125,000 cash, thereby terminating the latter's pipe line activities. The system involves 36 miles of discharge lines and 60 miles of gathering lines, being mostly 2- and 4-inch diameter pipe.

Asks That Trade Missions Give Way to Normal Plan

The 15 foreign governments operating buying missions in this country have been asked to disband their organizations and, in the interim, to have them operate under normal commercial conditions so as to permit the resumption, as promptly as possible, of foreign trade through private channels. The State Department reported last week that the suggestion had generally been received sympathetically. Some fear that, unless eliminated, these buying missions might pave the way for state monopolies such as Russia's Amtorg.

Russia is one of the countries maintaining missions, the others being Great Britain, France, Australia, Belgium, China, Greece, India, Italy, the Netherlands, New Zealand, Norway, Poland, Portugal and the Union of South Africa. In normal times, all are important customers for American producers of oil products and other commodities.

Possibilities that England might go in for state trading in a large way were seen in an announcement that a government organization would be set up to handle the procurement of cotton for the English textile industry, coupled with an intimation that similar boards may be created for other commodities.

The State Department took the position that during the transition period the foreign purchasing missions here should attempt only to meet essential civilian requirements for relief and rehabilitation, and open their markets to private industry as quickly as possible. In the case of Russia, where the government normally controls all trade, it was recommended that one or more agencies be incorporated in this country, as was done before the war.

PIEA Elects New Officers

Officers of the Petroleum Industry Electrical Association, elected at Tulsa, are included in the group above, left to right, as follows: J. F. Collerain, named vice president; M. C. Callahan, elected president; R. C. Appling, named secretary-treasurer and F. W. Littell, a past president of the group.

Interior Department Budget Slashed By House Subcommittee; Oil Affected

Money requests of the Interior Department for the fiscal year beginning July 1, next, were slashed by the House Appropriations Committee last week when budget estimates of $346,765,830 were cut to $174,652,579. Members of the Senate, however, said they would work for restoration of some of the eliminated funds, particularly those having to do with oil activities.

Secretary J. A. Krug said the action imperils department plans to take an itemized inventory of the natural wealth of the country, a project designed to take 20 years, although Krug had hopes of speeding it up so that within five years, in the event of another war, the government would have the data.

Headed by Representative Jed Johnson of Oklahoma, the subcommittee cut $30,092 from the estimates for the petroleum conservation division, allowing it $216,908, or $18,796 in excess of current requirements, and denying additional employes contended necessary for enforcement of the "hot" oil act.

Denying a request of the Geological Survey for $2,463,500 for the census of natural wealth, the committee allowed only $1,200,000, or $11,700 more than for the current year, and halved a $215,000 increase sought for surveys of minerals on the public lands and naval petroleum reserves, allowing only $575,500.

The Bureau of Mines was particularly hard hit, its estimates of $20,231,400 being cut to $11,298,439, which is $6,440,051 under the current appropriation.

A $7 million item sought for continuance of the synthetic liquid fuels program was slashed to $3,500,000, a request for $837,000 for oil and gas investigations reduced to $772,000, and an item of $107,000 for helium utilization and research cut to $87,400. The slash in funds for oil and gas investigations included $50,000 denied for secondary recovery, $10,000 for thermodynamics of hydrocarbons and $5000 cut from a proposed increase of $30,000 for the Bartlesville experiment station.

Without mentioning former Secretary Ickes by name, the committee assailed "inefficiency and gross extravagance in certain agencies" and demanded that the department "place its house in order." It expressed the hope that under Krug the department will be placed on a more efficient basis.

PIWC Head Is Awarded U. S. Medal of Merit

William R. Boyd, Jr., API president, last week received the medal of merit in the office of Secretary of the Interior Julius A. Krug, the presentation being made by Krug for exceptionally meritorious conduct in performance of outstanding services to the United States as chairman of the Petroleum Industry War Council.

"Mr. Boyd directed the industry's part in the greatest government-industry partnership in the history of the United States," President Truman said in the citation. "He contributed materially to one of the outstanding victories of the war—the assurance of petroleum for every military and essential civilian need of the United Nations."

On the same day the medal was presented to Robert P. Russell, president of Standard Oil Development Company by Major General Alden H. Waitt, chief of the chemical warfare service in New York.

The award to Russell was for his direction of research and development in the field of flame-throwers, incendiaries and smoke generators, and at this time his company received the Naval Ordnance development award for its work in those fields. The Naval Ordnance certificate for exceptional service also was awarded to Russell and seven other company scientists and engineers: N. F. Myers, H. G. M. Fischer, M. D. Haworth, S. H. Hulse, J. O. Collins, G. Wengisch and R. L. Betts.

Crude Oil Production in the United States

(Estimates compiled by the OIL WEEKLY. All figures indicate daily averages in barrels.)

State or District	PRODUCTION IN WEEK ENDED May 11	May 4
Alabama	1,100	1,100
Arkansas	77,800	77,250
California	859,400	860,000
Colorado	26,700	27,150
Florida	250	250
Illinois	209,600	212,100
Indiana	19,300	19,500
Kansas	245,300	244,650
Kentucky	31,000	30,900
Louisiana	376,950	*377,400
North Louisiana	85,500	85,950
South Louisiana	291,450	*291,450
Michigan	46,100	†46,000
Mississippi	60,750	57,050
Missouri	100	100
Montana	20,050	20,100
Nebraska	800	750
New Mexico	95,750	*95,750
New York	13,950	†14,350
Ohio	8,100	7,350
Oklahoma	373,250	363,700
Pennsylvania	36,350	37,250
Tennessee	35	35
Texas	2,114,800	*2,114,800
Upper Gulf Coast	486,000	*486,000
East Texas Field	388,800	388,800
Rest of Eastern Texas	139,600	*139,600
Southwest Texas	331,500	*331,500
West Texas	521,100	*521,100
North Texas	164,800	*164,800
Panhandle	83,000	83,000
West Virginia	8,500	7,750
Wyoming	105,750	†105,800
Total United States	4,731,685	†4,721,085

* Revised to exclude condensate production.
† Revised.

Total stocks, foreign and domestic, May 4, as reported by the Bureau of Mines were 221,911,000 barrels with a daily average production of 4,721,000 and runs to stills 4,672,000.

Sinclair Plans Immediate Products Lines Extensions

Plans for immediate expansion of its network of products pipe lines have been announced by the Sinclair Refining Company. Much of the construction is scheduled for completion this year.

The Chicago-to-Toledo line will be extended northward to Detroit. This extension consists of 56 miles of 6-inch line with a terminal having about 120,000 barrels of steel storage at Detroit, one pump station and a communication system.

From Toledo a line is being constructed to Columbus through Marion, Ohio, involving the construction of 118 miles of 6-inch line, two pump stations and about 100,000 barrels of storage at Columbus.

Further expansion of the same system will extend from Marion to Cleveland, Akron and Youngstown, joining the present Marcus Hook-Steubenville line at the latter point. This construction will involve the laying of 225 miles of 6-inch pipe.

Chamber Panel Agrees Resources Not Vanishing

America's natural resources are not "vanishing" at an alarming rate according to speakers at the National Chamber of Commerce convention in Atlantic City.

Although William B. Heroy, former director of foreign production for the PAW, reported that the war made a heavy drain on our crude reserves and ended with a daily refining capacity 300,000 barrels in excess of productive capacity, he said that present difficulties could be overcome by government encouragement of domestic prospecting and development, adequate state conservation laws, exploration of potential areas such as the continental shelf, development of foreign oil reserves by American interests, and imports of foreign oil to supplement domestic supplies.

The concensus of the panel was voiced by Governor Robert S. Kerr of Oklahoma, who presided.

"I do not subscribe to the viewpoint of those who predict that we are about to become a 'have not' nation," Kerr said. "America's system of free competitive enterprise has demonstrated the ingenuity, first, to find new reserves of natural resources; second, to develop improved methods for greater utilization of our known supplies; third, to find substitute materials when needed; and, fourth, through chemical research and advances to develop such a variety of usable materials as to insure acceptable replacements long before exhaustion of any given resource."

Meeting Postponed

The meeting of the agricultural development committee of the American Petroleum Institute, scheduled May 15 in Chicago, has been postponed indefinitely due to transportation difficulties which have come as a result of the coal strike.

Development of Natural Gas Industry Reviewed on AGA Convention Program

By C. C. PRYOR, Staff Writer

Plans and progress of the natural gas industry were revealed at the meeting of the Natural Gas Department of the American Gas Association in Cincinnati, May 7 and 8. More than 500 executives heard 28 papers and reports on transmission, production and storage, accounting, management, promotion, and technical and research programs.

In his opening remarks, R. H. Hargrove, chairman of the Natural Gas Department, and vice president and general manager of United Gas Pipe Line Company, Shreveport, La., said: "The natural gas industry now serves 41 million people in 33 states with a network of 218,000 miles of trunk pipe lines and mains with a total production of three and one-half trillion feet and a market value of $750 million. It has advanced from 38 to 48 percent in the number of customers served by the whole gas industry. A recent statistical analysis of 116 natural gas companies shows total assets of over three billion dollars.

"Withdrawal of natural gas must be on an orderly, well-coordinated and economic basis, with due regard to the best interests of the public, both producing and consuming," E. J. Boothby, association president and vice president and general manager of the Washington (D. C.) Gas and Light Company. "Exploitation for private gain must be discouraged."

Union Activity

In the opinion of Fred R. Rauch, vice president and director of industrial relations, Cincinnati Gas & Electric Company, "Increased union activity in the gas utilities can be expected as the competitive position of gas is improved in relation to coal." Rauch is chairman of the personnel committee of the association.

"There isn't any power or authority in this country that can or is willing to force a union leader to bargain in good faith if he does not wish to, or to prevent his union from paralyzing the entire nation by a tie-up of production," he said.

"The public interest requires modification of the National Labor Relations act so that organized labor as well as management will be required to accept full responsibility for its acts. Organized labor is no longer weak and for the orderly purposes of collective bargaining does not now require the legal advantages it has held over management since the enactment of the National Labor Relations act."

Edward Buddrus, president of Panhandle Eastern Pipe Line Company, stressing the competitive position of the industry, quoted a recent announcement stating that the National Coal Association has assessed a two-mill per ton pledge, amounting to $600,000, to be used for fighting inroads of gas and oil into their markets.

Further discussion was given by E. Holley Poe, of E. Holley Poe and Associates of New York, who said, "While the natural gas industry was boosting its sendout during the war period by over 50 percent, the bituminous and anthracite industries were having their usual strikes and left about 82 million tons of coal in the ground. Critical war production waited for the historical process of the coal industries to be completed."

Gas Turbine Development

J. Kenneth Salisbury, Turbine-Generator Engineering Division of General Electric Company, traced briefly the development of the gas turbine for aircraft. The gas turbine has a tremendous future ahead especially for aircraft and marine applications, he said. Giant planes, larger than any now in use, are being designed to utilize single or dual power plants located in the fuselage of the plane, and driving propellors of the conventional type and pusher-type, he said. Marine engines are successful beyond expectations. Their size and weight reduction per horsepower delivered is of greatest importance in this application. The gas turbine will not replace or make obsolete the steam turbine due to thermal efficiency differences as well as applications, he said.

P. C. Keith, president of Hydrocarbon Research, Inc., described the manufacture of gasoline and oil from dry natural gasoline and the new $15 million plant to be erected near Brownsville, Texas. The new plant will process 64 million cubic feet of gas per day to produce about 6500 barrels of gasoline, 1000 barrels of diesel fuel, and 150,000 pounds of alcohol. It will also produce 40 million feet of oxygen at a lower rate than heretofore possible in this country. Gasoline produced by the process compares favorably with other methods at about 5¼ cents per gallon. Coal can be gasified to produce pipe-line gas of 1000 Btu by the use of oxygen and that research is being carried further.

Keith revealed that an iron catalyst, worth only a few cents per pound, will be employed. The process can be easily controlled and made to produce as much as 85 percent gasoline of 88 octane.

"The Brownsville plant will have a far-reaching effect on national economy," he said. "After the plant has been operated for a period, the figures for oil reserves should be doubled and eventually there will be a ceiling on crude oil of less than $2 per barrel. Natural gas will compete with crude oil, and will have a higher price at the wellhead."

Keith said that 160 million barrels of oil could be made from the flared gas in the country. From the fuel gas to refineries enough gasoline could be made to supply 78 percent of the demand of the country.

Keith referred to the FPC investigation and asked, "Why worry about legislation about the use of gas which won't come to an end in 3000 years? All estimates of natural gas reserves will have to be doubled due to the process to be used in the plant at Brownsville. Coal can be easily converted into pipe line gas having a btu content of 1000 and therefore, the supply of materials for the manufacture of gas will be limited only by the supply of coal."

Other reports presented included an "Industry Promotion Program," by D. A. Hulcy, chairman of the promotional committee, and president of Lone Star Gas Company, Dallas, who outlined the promotional activities of the association and its purpose and benefits. "Much of the future of the gas industry," he said, "will be measured by the extent to which gas is used in the millions of new homes that are to be built and millions of others that are to be modernized."

H. D. Hancock, technical research committee chairman, and president of Gas Advisers, Inc., reported that research activities within the natural gas industry were necessarily curtailed during the war period except in certain critical cases. There was, however, a nation-wide concentration of technical effort and war-accelerated progress in the broad fields of metal production, metal fabrication, and chemicals, which will importantly affect many industries which either utilize natural gas as fuel or process material or which produce equipment or materials used by our members, and thus have a bearing on the development and opportunities for the continued growth of the industry we represent. Activities have now been resumed in the fields of natural gas production and transportation.

Liquefied Petroleum Gas

H. Carl Wolf, managing director of the association, declared that the "rugged individual" did the work of discovering gas fields, markets, and building the industry. Submerged for a time, the individual again came to the front during the war emergency, and now modified is combining his talents into teams. Teamwork, he said, is most important to the gas industry at this time. Research of the natural gas industry is the envy of other industries, he added.

Francis E. Drake, Pacific Gas Corporation, pointed out that liquefied petroleum gas sales have increased from 403,674 gallons in 1925 to 905,600,000 gallons for 1944, with 1945 showing further increases.

"The aim of all gas men, natural and manufactured, is to maintain a uniform flow through their lines at all times, he said. The natural gas company is penalized during the winter months by the terrific peak built up through the heating load. To offset this, some transmission companies have established peak shaving rates based upon the maximum day of the year. These rates credit a utility who keeps a peak shaving plant ready and uses it for reducing those high days to a more normal level.

"All such peak shaving plants other than liquefied petroleum gas plants require trained labor available all months in the year for possibly six to twelve days operation. A high investment which in turn means high depreciation also is necessary.

"Propane-air plants can be all automatic, only pilot lights burning, consuming but little fuel, and ready to cut in instantly when the gas main pressure drops below a predetermined point. No experienced labor is needed."

The importance of corrosion in high pressure gas wells, was discussed in a paper by T. S. Bacon, Lone Star Producing Company, read by L. T. Potter, chairman of the production and storage committee, and superintendent of production, Lone Star Gas Company.

NACE Sessions

Program at Kansas City convention includes papers on corrosion problems in oil, gas and other industries; Association shows remarkable growth; Officers named

By WARREN L. BAKER, Editor

Progress made in combatting corrosion that attacks pipe lines, condensate producing well and other oil and gas field equipment was described in papers presented at the annual convention of the National Association of Corrosion Engineers, which was held in Kansas City last week. Most of the papers dealt with laboratory and field studies of ways to retard corrosion, and the majority of them reported substantial advancements had been achieved or were indicated by experimental results.

The program for the convention consisted of symposium on corrosion problems of the water industry, the electrical and communication industry, the chemical industry, the gas industry, the oil industry, and general industry. A total of 35 technical papers and 2 dinner addresses were presented. In addition approximately 40 concerns exhibited materials and devices for combatting corrosion. The exhibit is to become a regular feature of annual meetings.

This young association has shown an amazing growth since its organization in 1943 with only 8 members. Today it has more than 1000 active members, and a sizeable group of associate and corporate members. More than 500 registered for the convention in Kansas City, the second in the history of the association.

Abstracts of papers presented at the symposiums devoted to oil and gas follow:

Use of Sodium Chromate for Control of Corrosion in Gas Condensate Wells

By C. K. Eilerts, H. A. Carlson, R. V. Smith, F. G. Archer, and V. L. Barr, Bureau of Mines, Bartlesville, Okla.

The United States Bureau of Mines is conducting studies for the purpose of developing an inhibitor or treating agent that will reduce the rate of corrosion in condensate wells.

After laboratory tests had indicated that the injection of sodium chromate into producing wells would retard the corrosion rate, the injection of this chemical was tried in the Cotton Valley field.

A careful check has been maintained in the field, and results indicate sodium chromate to be a promising corrosion retarding agent in condensate wells, and its injection into the annulus space between the tubing and casing seems practical. The iron content of the waters in condensate wells has been reduced by the injection of sodium chromate in quantities ranging from 200 parts per million to 1000 parts per million, and studies of metal coupons show that corrosion rates have been reduced.

Laboratory Studies for Determination of Oragnic Acids As Related to Internal Corrosion of High Pressure Condensate Wells

By E. C. GRECO and H. T. GRIFFIN, United Gas Pipe Line Company, Shreveport, La.

In November, 1944, laboratory research work was begun with the following objectives in mind:

1. To isolate from condensate waters organic acids and other materials which might be contributing to the corrosion of condensate wells.
2. To determine the organic acid content of a number of waters in several fields.
3. To see if a correlation could be found between the concentration of organic acids in the water and the degree of corrosion taking place in the wells.
4. To work out a method by which these acids could be separated from each other. This is still in process.

Results of the work indicate that concentrations of organic acids in waters from these wells point to a degree, or a potential degree of corrosion. However, it is believed some hydrocarbon condensates and waters may have present in them certain natural inhibitory materials which may tend to protect the tubing to some extent. Wells producing these hydrocarbon condensates and water, even though the waters contain corrosive amounts of organic acids and carbonic acid, will have a milder corrosion history than wells which contain none of these natural inhibitory materials. However, no work has been done along this line as yet. This same view has been expressed verbally by Drs. Lochte and Hackerman, of the University of Texas.

Resistance of Some Nickel Containing Alloys To Corrosion by West Texas Crudes

By B. B. Morton, The International Nickel Company, Inc., New York.

Experience has shown the resistance of high nickel containing alloys to the corrosives encountered in producing West Texas crudes is of such a higher order that nearly complete immunity to attack upon sucker rods, deep well pumps and other equipment can be expected.

A trend toward increased nickel contents in sucker rod materials is noted. A newcomer in the form of an 8-10 percent nickel alloy has made its appearance. The effects of the higher nickel content upon the "air" endurance limit under corrosive conditions remains to be determined before a final assessment of the value of this newly developed steel can be made for sucker rod use. The endurance limit suggests it for heavy pumping conditions in the absence of marked corrosion.

Protective surfaces, like nickel plating, are being used in some locations

Officers Named

F. J. McElhattan, Panhandle Eastern Pipe Line Company, Kansas City, Mo., was elected president of the National Association of Corrosion Engineers, to succeed R. A. Brannon, Humble Pipe Line Company, Houston. The election took place by mail ballot, and the results were announced at the annual convention.

G. R. Olson, United Gas Pipe Line Company, Shreveport, is the new vice president, a position held last year by McElhattan. O. C. Mudd, Shell Pipe Line Company, Houston, was re-elected treasurer.

The following were elected to the board of directors: Representing active membership: Guy Corfield, Southern California Gas Company, Los Angeles; A. N. Horne, Water Emergency Pipe Lines, Inc., Cincinnati; F. L. LaQue, International Nickel Company, Inc., New York.

Representing corporate membership: F. L. Goldsby, Chicago Bridge & Iron Company, Chicago; G. W. King, Brance-Krachy Co., Inc., Houston; L. G. VandeBogart, Crane Company, Chicago.

Representing Associate membership: L. A. Baldwin, Johns-Manville Sales Corporation, New York; M. L. Jacobs, Jacobs Wind Electric Co., Minneapolis; E. L. Rolfs, Crutcher-Rolfs-Cummings, Houston.

Regional directors: Robert Pope, Bell Telephone Laboratories, New York, for Northeast United States; H. B. Britton, Plantation Pipe Line Co., Atlanta, for Southeast United States; H. J. McDonald, Illinois Institute of Technology, Chicago, for North Central United States; L. F. Scherer, The Texas Pipe Line Co., Houston, for Southwest United States; and F. A. Hough, Southern Counties Gas Company, Los Angeles, for the West Coast.

Directors ex-officio: R. A. Brannon, Humble Pipe Line Company, Houston; S. P. Cobb, Ebasco Services, Inc., New York; Ivy M. Parker, Plantation Pipe Line Co., Atlanta; R. B. Mears, Aluminum Company of America, New Kensington, Pa.; and George B. McComb, The Barrett Division of Allied Chemical & Dye Corporation, New York.

Japan Oil Production Shows Gain in March

Japanese oil production currently is running approximately 103,785 barrels a month, General Douglas MacArthur's headquarters recently disclosed.

The report showed that output for the four weeks ended March 9 increased 805 barrels over the preceding four weeks. For the same period, refined production was 105,552 barrels against 86,016 barrels.

Seven fields are in production, the largest being Akita, where the production was 52,118 barrels for the month ending March 9. Output from the Kashiwasaki field was 24,865 barrels, and that of the Yamagata field was 22,826 barrels. Other production include 1583 barrels from the Hokkaido fields, 1461 barrels from Niitsu, 556 barrels from Niigata, and 553 barrels from Hachimori.

During the period reported Nippon Oil Company was operating refineries at Akita, Kashiwasaki, Niigata and Yokohoma. Nippin Kogy was operating at Funakawa, and Showa Oil Company was working at Hirasawa and Niigata.

Production included 17,650 barrels of gasoline, 14,631 barrels of kerosine, 2680 barrels of gasoil, 39,904 barrels of diesel oil, 12,699 barrels of fuel oil, and 18,990 barrels of lubricating oil.

where the corrosion rate is exceptionally severe. A very long life from nickel plated rods can be assumed provided the rods are prevented from striking the walls of the tubing. Destruction of nickel plating from contact with the tube walls has led to the use of a heat treatable form of Monel (K-Monel) for some trial strings, and excellent results have been reported.

Monel has distinguished itself as a polished rod material when used in solid rod form and not as a jacket. Performance suggests its use in heaving pumping fields.

Monel, K-Monel and Inconel are used widely in oil well pumps for such parts as traveling tubes, rings, valve parts and liners. For applications involving abrasion, chromium plating is often applied over the nickel part.

The high corrosion resistance of K-Monel, the fair degree of hardness obtained from this alloy and its non-magnetic quality, all have combined to further the use of this alloy for balls and seats.

Monel and K-Monel are widely used for the important parts of much gas-lift equipment.

Results of Some Studies of the Condensate Well Problem

By WALTER F. ROGERS and HARRY WALDRIP, Gulf Oil Corporation, Houston

A study has been made of the wetting power of condensates and waters for steel in the presence of each other. This has been done both with and without the addition of wetting agents and the resulting effect on the corrosion rate of the mixture studied by laboratory methods. In addition the testing has been extended to field operations. It is concluded that:

1. None of the condensation from eight fields tested have sufficient wetting power to displace their present produced water from steel and as a consequence are non-protective and do not prevent the steel from being water wet except as noted in Item 2.

2. Some protection is obtained from fluids of high condensate percentage due simply to the mass effect of large amounts of condensate and small amounts of water.

3. The aggressiveness of the aqueous phase produced with the hydrocarbon governs the corrosion rate. Waters of low salt content are less corrosive than waters high in salt content. If the aqueous phase is present in appreciable amounts and is corrosive to steel in the absence of condensate, corrosion will take place and if not no corrosion will occur in the well.

4. The corrosion rate of a well can increase as the salt content of the aqueous phase increases or as the water percentage increases.

5. Laboratory tests show that the corrosion rate can be decreased by increasing the wetting power of the oil through the use of addition agents. The corrosion rate obtained for drop size ratios above 1.000 depend upon the percent water produced. For drop sizes below 1.000 all condensates tested at concentrations as low as 15 percent condensate were protective.

6. The extension of the use of wetting agents to producing wells did not give the same beneficial effects as found in the laboratory.

7. The use of sodium nitrite was found to be uneconomical as a corrosion inhibitor.

Prevention of Condensate Well Corrosion By Chemical Treatment in the Erath Field

By W. D. YALE, The Texas Company, Houston

Data obtained in the Erath field indicate that sodium dichromate is an effective corrosion inhibitor. This conclusion is based upon the correlation obtained by iron reduction in the produced water, coupon exposure tests, and caliper surveys.

The iron content has been held to less than 5 ppm when the orange color of the dichromate is apparent. Dichromate injection rates of 4 to 5 pounds per day in a 10-gallon solution have been found to be sufficient to maintain chromate residuals in the produced water of 500 to 1000 ppm.

Caliper surveys have shown that in the case of dichromate treatment over a period of seven months there is no corrosion evident. Caliper surveys have shown good correlation with visual inspection of tubing.

Coupon tests in each case of dichromate injection has shown a very great reduction in corrosion rate. These reductions have varied from 88 to 96 percent. Coupon tests have shown corrosion rates as high as 0.01511 inches penetration per year in an untreated well. Corrosion rates as high as 0.009 inches penetration per year in the absense of dichromate treatment have been reduced to 0.0007 inches penetration per year with dichromate injection.

Use of sodium hydroxide as an inhibitor does not appear to be practical. Coupon tests have shown that a perceptible retardation of corrosion has not taken place with injections of caustic in volumes as high as 10 pounds per day. Water analysis results have been exceedingly erratic.

The possibility of reducing corrosion rates and localized pitting by substituting internally flush, fully normalized tubing for upset tubing is being investigated but no conclusive data have been obtained as yet.

Metallurgical Phases of High Pressure Corrosion Problems in Distillate Wells

By M. E. HOLMBERG, Phillips Petroleum Company, Bartlesville, Okla.

Corrosion in distillate wells is often localized. One factor frequently neglected is variations within the metal itself. It should be recognized that metal strength differs from section to section, that metal composition is not uniform, inclusions are present, and the crystalline structure varies. These differences affect the manner in which a metal corrodes.

Corrosion is often associated with the upset ends of tubing, where it has been necessary to heat the ends to forging temperature. The result is that the ends differ from the balance of the tube, with the zone adjoining the upset exposed to a temperature gradient. The net result is that where the temperature gradient existed, there is a band of fine metal that coarsens toward the upset. Examinations have repeatedly shown a ring of interior corrosion adjacent to the fine grained metal located in the temperature gradient area.

Turbulence is not the cause since the location of the ring of corrosion varies in accordance with the length of the section heated and can also be found at both ends of the tube. Invariably the ring of corrosion is adjacent to the fine grained metal. Excess scale apparently is not responsible for the "ringworm" corrosion as it has been observed frequently in galvanized tubing.

This type of corrosion can be avoided by normalizing the full length of tube, which results in recrystallization of the metal throughout its length. "Ringworm" corrosion in oil well tubing has been eliminated by the use of fully normalized tubing.

Differences in metal structure also may be a factor in the corrosion of couplings, although other factors, such as turbulence, undoubtedly also contribute to coupling corrsion.

Low-carbon steel is not always found to be more corrosion resistant in oil well service than high-carbon steels, and consideration must be given to the manner in which the carbides are present. Examinations have indicated that steel with a well pearlitic structure corrodes slower than a similar steel with a spheroidized structure.

Maintenance of Oil Field Equipment

By D. R. HISKEY, Dearborn Chemical Company, Los Angeles.

It is well known that two of the most important factors accounting for the rusting of iron are moisture and oxygen and also that if either factor, or both, be controlled then corrosion can be defeated. Millions of dollars worth of metal is being destroyed every year because of corrosion, with a tremendous loss to industry in equipment, time, labor and money. Therefore, it is apalling to see the amount of metal which has had no protection for years.

Much of this metal loss can be prevented if a program of equipment maintenance is developed. This can be done if the proper materials are obtained and applied. There are many types of materials which have been used successfully for the prevention of rust, and coating manufacturers are devoting much time and money in formulating new materials. On any type of new construction, no matter where installed, as much attention should be given to the selection of protective coatings as to any other part of the job. Rust preventatives applied at the time of installation will cut maintenance to the minimum.

Too much emphasis cannot be placed on the selection of the proper protective coating. Two very important factors in the success of any coating are proper bonding and proper preparation of the metal surface. Plasticity of a coating and its resistance to shock, and its ability to conform to irregular surfaces is desirable. Chemical rust inhibitors are extremely important. Available protective coatings can be easily and economically applied to give the desired protection. New plastic coatings will have a wide application in the oil industry, because of their resistance to petroleum products, their resistance to acid and alkali conditions and their resistance to abrasion.

Installation and Protection of Underground Gas Distribution Systems with Pipe Line Enamels

By P. D. Mellon, Canadian Western Natural Gas, Light, Heat and Power Co., Ltd., Calgary, Alberta, Canada.

Natural gas companies in Alberta are geographically isolated from other gas companies and from rolling mills equipped for applying protective pipe coatings. Further, there have not been as yet any firms catering to the application of pipe coatings. For these reasons

• CONTINUED ON PAGE 65

Postwar *Oil* Demand Exceeds Estimates

By L. J. LOGAN, Associate Editor

TRANSITION from war to peace has caused much less curtailment of oil industry operations than generally expected. Just as actual wartime demand for petroleum exceeded highest estimates, so is postwar demand surpassing the most liberal forecasts.

Contrary to many expectations, charts showing the curves of petroleum demand and supply on an annual basis will not embody sharp declines because of change from war to peace.

Instead, there will be only moderate dips for 1946, and early climbs thereafter into new high ground.

Absence of sharp declines will be due in the first place to the fact that war ended in both Europe and Asia around the middle of 1945. Data for that year consequently were tempered by postwar influences in the latter half, which caused 1945 operations to be only moderately above 1944, in spite of the unprecedented highs reached as war ended.

Furthermore, following the preliminary readjustments in late 1945 additional readjustment required in 1946 is less than expected, and the year as a whole promises to compare surprisingly well with 1945.

10 Percent More Demand

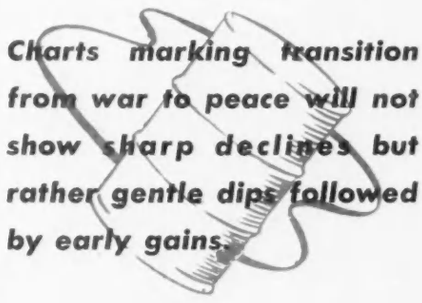
Demand for petroleum in 1946 now is expected to be as much as 10 percent higher than was indicated last fall. This change in the outlook is due to unforeseen heavy military and merchant marine demand for fuel oils and to the soaring of motor gasoline consumption to unexpected levels.

The large requirements for fuel oils have been caused by the rapid demobilization of the armed forces and the extensive relief and rehabilitation activities in the war areas.

Surprisingly sharp demand for gasoline has resulted from several causes, including the heavy motor traffic of war workers moving out of war production areas, the accelerated demobilization of the armed forces, the relatively mild weather during the past winter and spring months, and the increases in use of automobiles generally following the lifting of rationing.

During the first quarter of 1946 the total United States demand for petroleum, for domestic use and export, was approximately 10 percent greater than most forecasts made at the beginning of last fall.

Practically all the principal petroleum products have been required in volumes greater than expected at that time. Gasoline demand has been 15 percent greater than anticipated. Distillate fuel oils have been needed to an extent 10 percent greater than forecast. About 7 percent more residual fuel oil than forecast has been actually required.



Charts marking transition from war to peace will not show sharp declines but rather gentle dips followed by early gains.

In the midst of the war there was not a great deal of speculation as to the trends of petroleum demand after the war. But some of those who ventured estimates thought that demand would be less than in 1941, the last prewar year for the United States, because of the long lapse in automobile production. Estimates of those who thought demand would resume after the war about at the 1941 levels were widely doubted.

Now it is proved that such estimates were not merely conservative but greatly in error on the low side. The industry is not dropping its operations anywhere near the 1941 levels and will not do so at all. After all the wartime and postwar readjustments, the industry is stabilizing operations far above the 1941 levels and comparatively close to the war-time highs, in preparation for peacetime expansion which should be well under way in 1947.

In the first quarter of 1946, the total demand for petroleum products, domestic and export, was approximately a third greater than that in the like period of 1941. Sales of some individual companies have been 35 percent or more above those in the first quarter of 1941.

Although Bureau of Mines figures are not yet available on petroleum demand in the first quarter of 1946, the approximate demand is revealed by the weekly reports of The American Petroleum Institute on refinery runs, crude production, output of prinicpal refined products, and stocks of crude and products.

These figures indicate that for the first quarter, total demand for petroleum was only about 3 percent lower than in the like period of 1945 and about 30 percent greater than in the initial quarter of 1941.

In the first quarter of this year there was no material net change in the total stocks of all oils, an increase of about ½ million barrels being indicated. Crude stocks increased 6 million barrels and gasoline stocks 7 million, but distillate stocks were reduced 7½ million, kerosine 1 million, and residual stocks 4 million.

Stocks of Crude Petroleum in U. S. by Grades, at End of March

(Based on Weekly Reports of U. S. Bureau of Mines)

(THOUSANDS OF BARRELS)

Grade or Origin	March 29, 1941	March 31, 1945	March 30, 1946	Change 1941-1946
Pennsylvania Grade	4,291	2,226	2,162	— 2,129
Other Appalachian	1,400	1,296	1,608	+ 208
Lima-Michigan	1,114	954	1,041	— 73
Illinois-Indiana	21,807	14,421	18,704	— 3,103
Arkansas	2,888	2,655	2,608	— 280
Kansas	8,961	9,252	9,542	+ 581
Louisiana	12,897	12,937	11,368	— 1,529
Northern	4,342	3,140	2,987	— 1,355
Gulf Coast	8,555	9,797	8,381	— 174
Mississippi	789	1,102	2,485	+ 1,696
New Mexico	7,222	7,105	5,744	— 1,478
Oklahoma	64,276	30,448	35,851	— 28,425
Texas	85,178	112,074	102,914	+ 17,736
East Texas	20,561	19,120	16,570	— 3,991
West Texas	15,953	31,917	35,027	+ 19,074
Gulf Texas	23,544	32,173	26,683	+ 3,139
Other Texas	25,120	28,864	24,634	— 486
Panhandle		5,434	4,498	
North		7,442	6,412	
South		6,641	5,244	
Other		9,347	8,480	
Rocky Mountain	15,575	6,453	8,003	— 7,572
California	37,221	20,301	19,917	— 17,304
Foreign	2,568	2,558	3,047	+ 479
Total Gasoline Bearing in U.S.	266,187	223,782	224,994	— 41,193
Heavy in California	11,963	5,897	4,505	— 7,458
Total U.S.	278,150	229,679	229,499	— 48,651

Demand, Supply Balanced

Therefore, total demand and total current supply were nearly the same, and crude runs to stills constituted a close index to demand. The total amount of crude runs to stills in the first three months of 1946 were approximately 415,357,000 barrels, a decrease of 2.6 percent from the 426,238,000 barrels run in the like months of 1945, but 29 percent more than the 322,187,000 barrels charged to stills in the first quarter of 1941.

In line with general expectations, comparatively large exports are important in the demand situation, being greater than last year and also higher than in others years back through 1939. The increases in exports have materially cushioned the postwar decreases in over-all domestic demand.

In supplying the unexpectedly large volumes of crude for refinery runs, there has been more use of foreign crude in 1946 than in 1945, as well as increased importation of heavy fuel oils for meeting large demand for those oils. But domestic production has continued as the predominant source of crude supply, and the U. S. crude production has run materially higher than foreseen.

In the first quarter of 1946, domestic production totaled approximately 411,-

U. S. Crude Production, by States and Districts, March and First 3 Months

From U. S. Bureau of Mines, except 1946, estimated from A.P.I. weekly reports

(THOUSANDS OF BARRELS)

State or District	MONTH TOTAL, MARCH				Daily Average in March			TOTAL, FIRST 3 MONTHS			
	1941	1945	1946	% Diff. 1945-46	1941	1945	1946	1941	1945	1946	% Diff. 1945-46
Alabama	.....	11	31	+181.8	.....	0.4	1.0	.....	27	80	+196.3
Arkansas	2,191	2,475	2,392	— 3.4	70.7	79.8	77.2	6,299	7,231	6,947	— 3.9
California	18,903	28,020	26,345	— 6.0	609.8	903.9	849.9	54,941	80,826	76,067	— 5.9
Colorado	125	267	765	+186.5	4.0	8.6	24.7	355	808	2,118	+162.1
Florida	.....	1	3	+200.0	.....	.....	0.1	.....	1	9	+800.0
Illinois	10,267	6,389	6,461	+ 1.1	331.2	206.1	208.4	29,415	18,633	18,829	+ 1.1
Indiana	642	360	565	+ 56.9	20.7	11.6	18.2	1,841	1,172	1,491	+ 27.2
Kansas	6,258	8,478	7,820	— 7.8	201.9	273.5	252.3	17,968	24,175	22,419	— 7.3
Kentucky	414	665	982	+ 47.7	13.4	21.4	31.7	1,225	2,367	2,755	+ 16.4
Louisiana	9,418	10,992	11,647	+ 6.0	303.8	354.6	375.7	26,687	31,712	33,438	+ 5.4
North	2,096	1,952	2,569	+ 31.6	67.6	63.0	82.9	6,116	5,746	7,285	+ 26.8
South	7,322	9,040	9,078	+ 0.4	236.2	291.6	292.8	20,571	25,966	26,153	+ 0.7
Michigan	1,189	1,506	1,389	— 7.8	38.4	48.6	44.8	3,510	4,295	4,027	— 6.2
Mississippi	570	1,562	1,725	+ 10.4	18.4	50.4	55.6	1,724	4,502	4,963	+ 10.2
Missouri	4	5	6	+ 20.0	0.1	0.2	0.2	11	9	18	+900.0
Montana	598	713	615	— 13.7	19.3	23.0	19.8	1,756	2,078	1,751	— 15.7
Nebraska	113	21	25	+ 19.0	3.6	0.7	0.8	337	74	71	— 4.1
New Mexico	3,268	3,250	2,970	— 8.6	105.4	104.8	95.8	9,272	9,406	8,776	— 6.7
New York	410	386	418	+ 8.3	13.2	12.5	13.5	1,206	1,078	1,215	+ 12.7
Ohio	273	258	234	— 9.3	8.8	8.3	7.5	806	661	675	+ 2.1
Oklahoma	13,005	11,483	11,548	+ 0.6	419.5	370.4	372.5	37,711	32,907	34,580	+ 5.1
Pennsylvania	1,336	1,096	1,074	— 2.0	43.1	35.4	34.7	3,983	3,030	3,123	+ 3.1
Tennessee	1	1	1	.....	.....	.....	.....	3	3	3	.....
*Texas	41,030	67,373	56,973	— 15.4	1,323.6	2,173.3	1,837.8	116,814	194,540	178,337	— 8.3
E. Texas Field	11,948	11,844	9,856	— 16.8	385.4	382.1	318.0	33,280	34,670	28,762	— 17.0
Rest of E. Texas	2,357	4,559	3,993	— 12.4	76.0	147.1	128.8	6,893	13,085	12,451	— 4.8
North Texas	4,088	4,626	4,554	— 1.6	131.9	149.2	146.9	11,750	13,174	13,694	+ 3.9
West Texas	7,365	14,760	13,680	— 7.3	237.6	476.1	441.3	20,432	42,740	42,931	+ 0.4
Tex. Panhandle	2,282	2,728	2,512	— 7.9	73.6	88.0	81.0	6,531	7,949	7,291	— 8.3
G. Coast, Upper	7,877	17,491	13,244	— 24.3	254.1	564.2	427.2	22,301	50,265	43,834	— 12.8
Southwest Texas	6,456	10,902	9,134	— 16.2	208.3	351.7	294.6	17,899	31,184	29,374	— 5.8
Utah	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
West Virginia	276	261	254	— 2.7	8.9	8.4	8.2	811	730	738	+ 1.1
Wyoming	2,357	3,185	3,346	+ 5.1	76.0	102.7	107.9	7,077	8,917	9,231	+ 3.5
Total U. S.	112,648	148,758	137,589	— 7.5	3,633.8	4,798.6	4,438.3	323,753	429,182	411,661	— 4.1

* Texas data by districts based on A.P.I., and so do not agree exactly with state total, which is on Bureau of Mines basis.

661,000 barrels, compared with the 415,357,000 barrels of domestic and foreign crudes run to stills in the meantime. As indicated previously, the domestic production was such that stocks were increased 6 million barrels during the quarter.

The 411,661,000 barrels of U. S. crude production in the first three months of 1946 represented a decrease of 4.1 percent from the 429,182,000 barrels produced in the corresponding months of 1945 but an increase of 27 percent over the 323,753,000 barrels produced in the first quarter of 1941.

While production of crude for the U. S. as a whole was about 18 million barrels less in the first quarter of 1946 than in the like period of 1945, the decrease was accounted for largely by Texas, which showed a 16-million barrel, or 8.3 percent, decline. New Mexico was down 6.7 percent and California 5.9 percent. Decreases were shown also in Arkansas, Kansas, Michigan, and Montana.

Some of these decreases reflected lower producing ability rather than curtailed market. Texas is about the only state whose production was cut back because of market conditions. And in Texas there has been since the end of March a pronounced resurgence of demand for crude to meet heavy requirements of fuel oils. Consequently, in April Texas production was increased above 2,050,000 barrels daily, compared with an average of less than 1,850,000 daily in March. Meanwhile, crude production has been higher this year than last year in Colorado, Wyoming, Illinois, Oklahoma, Indiana, Kentucky, Louisiana, Mississippi, New York, Ohio, Pennsylvania, and West Virginia. In the week ended April 20, 1946, U. S. crude production averaged 4,686,300 barrels daily, which was only 112,000 daily or 2.1 percent less than the 4,797,915 daily reported in the week ended April 21 a year ago.

1945 Trend Followed

Texas was producing about 116,000 a day less than a year previously (2,054,600 daily against 2,170,550), while decreases in Kansas, Arkansas and New Mexico were more than made up by increases in Oklahoma, Louisiana, Mississippi, Alabama, Illinois, Indiana, Kentucky, Michigan, Wyoming, Montana, Colorado, and the Appalachian states. In view of the above figures, it is seen that U. S. production of crude has recovered to a trend relatively close to that of 1945, and only moderate further expansion would mean equaling or exceeding last year's trend.

As in the case of crude production, decreases from last year in first quarter crude runs to stills have been mostly in Texas and California. U. S. runs of 415,357,000 barrels in the initial quarter of 1946 were about 11 million barrels less than runs of 426,238,000 barrels in the like period of 1945. Of the 11 million decrease, 6½ million were in California, over 2 million in inland Texas, and 1½ million on the Texas Gulf Coast. Decreases in the Appalachian, Illinois-Indiana, and Arkansas-North Louisiana refining districts were offset by increases in the coastal Louisiana, East Coast, and Oklahoma districts. During March, U. S. refineries operated at 86.2 percent of rated capacity, compared with 86.9 percent in the same month a year ago. In

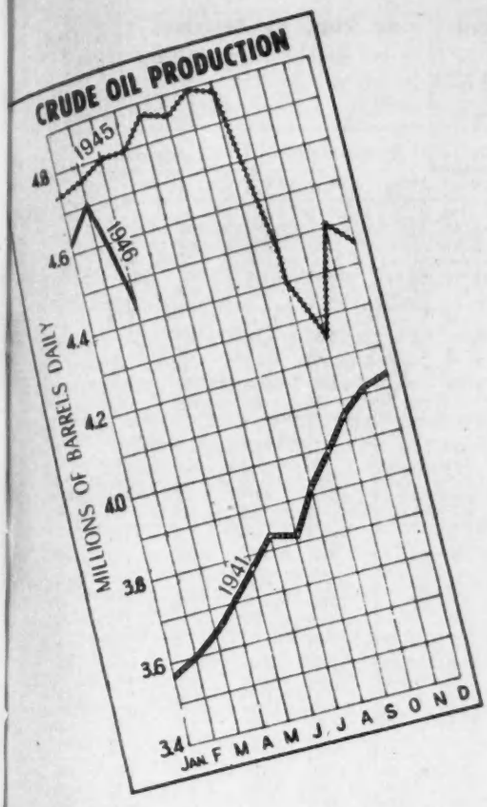
■ CONTINUED ON PAGE 40
(ALSO SEE TABLE ON PAGE 36)

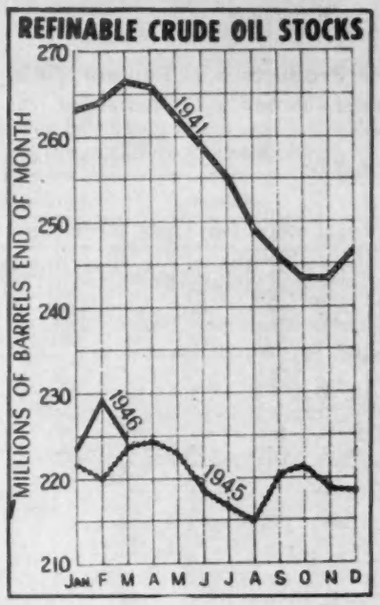
U. S. Crude Runs to Stills and Percent of Refinery Capacity Used by Districts, March and First 3 Months, 1941, 1945, 1946

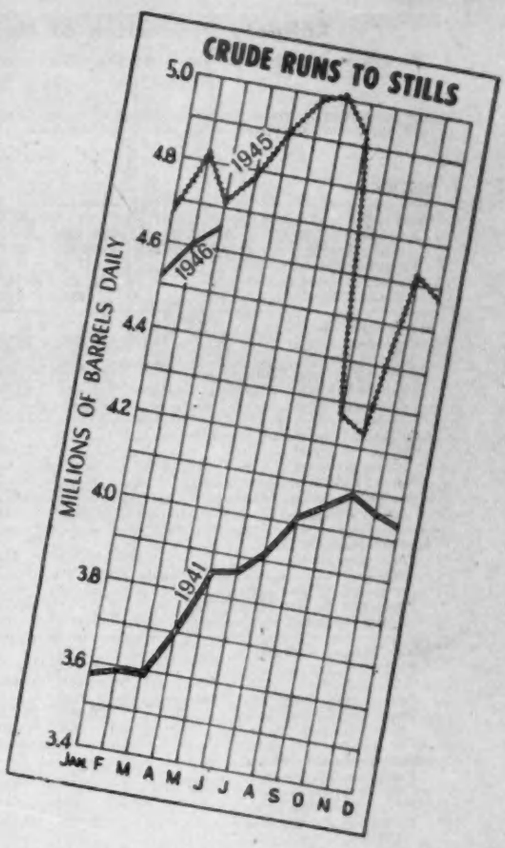
(Runs from Bureau of Mines, except 1946, from American Petroleum Institute; Capacities from American Petroleum Institute)

(THOUSANDS OF BARRELS)

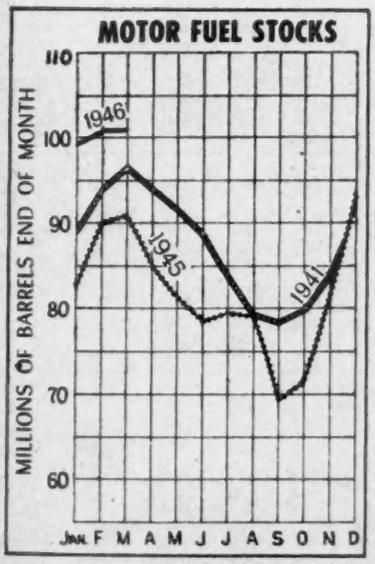
REFINING DISTRICT	CRUDE RUNS IN MARCH							REFINING CAPACITY AND USE, MARCH						TOTAL AMOUNT CRUDE RUN TO STILLS, FIRST 3 MONTHS			
	Total Amount Run				Daily Average Run			Daily Capacity			Percent Capacity Used						
	March, 1941	March, 1945	March, 1946	% Diff. '45-'46	Mar., 1941	Mar., 1945	Mar., 1946	Mar., 1941	Mar., 1945	Mar., 1946	Mar., 1941	Mar., 1945	Mar., 1946	Jan. to Mar., 1941	Jan. to Mar., 1945	Jan. to Mar., 1946	% Diff. '45-'46
East Coast	17,850	22,449	23,487	+ 4.6	576	725	758	643	791	791	89.6	91.7	95.8	50,247	65,387	67,640	+ 3.4
Appalachian	4,347	4,882	4,662	— 4.5	140	157	150	156	196	196	89.7	80.1	76.5	12,691	14,253	13,468	— 5.5
District No. 1	.....	3,020	2,919	— 3.3	.....	97	94	.....	146	146	.....	66.4	64.4	.....	8,874	8,295	— 6.5
District No. 2	.....	1,862	1,743	— 6.4	.....	60	56	.....	50	50	.....	120.0	112.0	.....	5,379	5,173	— 3.8
Indiana, Illinois, Kentucky	19,763	23,371	22,804	— 2.4	638	754	736	743	857	858	85.9	88.0	85.9	56,692	69,614	64,918	— 6.7
Oklahoma, Kansas, Missouri	10,214	11,672	11,923	+ 2.2	329	377	385	420	469	469	78.3	80.4	82.1	29,148	34,312	34,537	+ 0.7
Texas Inland	5,290	6,917	6,564	— 5.1	171	223	212	280	329	330	61.1	67.8	64.2	15,442	21,132	18,960	—10.3
Texas Gulf	28,164	35,633	35,306	— 0.9	908	1,149	1,139	1,071	1,237	1,237	84.9	92.9	92.1	83,309	103,465	102,007	— 1.4
Louisiana Gulf	4,000	8,399	9,797	+16.6	129	271	316	164	260	260	78.7	104.2	121.5	11,933	23,287	27,865	+19.7
Arkansas and Louisiana Inland	2,267	2,293	1,692	—26.2	73	74	54	101	126	127	72.3	58.7	43.7	6,578	6,993	5,086	—27.3
Rocky Mountain	2,579	4,078	4,040	— 0.9	83	131	130	121	172	172	68.6	76.2	75.6	7,525	11,479	11,070	— 3.6
District No. 3	.....	323	408	+26.3	.....	10	13	.....	13	13	.....	76.9	100.0	.....	999	1,123	+12.4
District No. 4	.....	3,755	3,632	— 3.3	.....	121	117	.....	159	159	.....	76.1	73.6	.....	10,480	9,947	— 5.1
California	16,585	26,591	24,226	— 8.9	535	858	781	836	995	967	64.9	86.2	80.8	48,622	76,316	69,806	— 8.5
Total United States	111,059	146,285	144,501	— 1.2	3,582	4,719	4,661	4,535	5,432	5,407	79.0	86.9	86.2	322,187	426,238	415,357	— 2.6

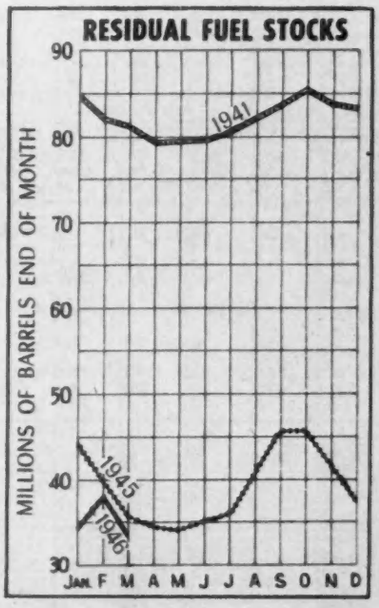


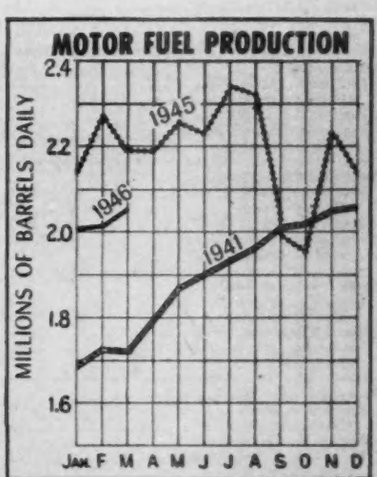


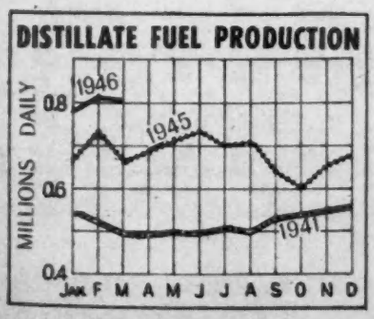


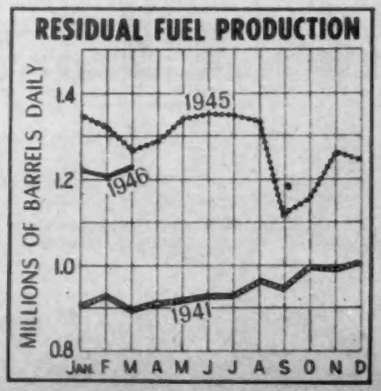
Monthly TRENDS

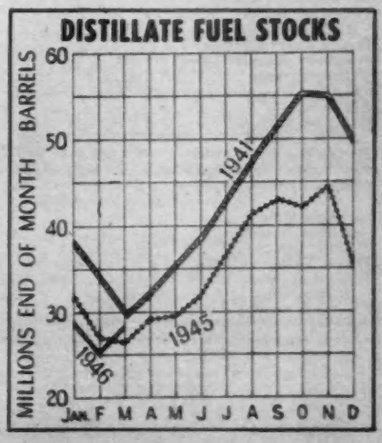












Refinery Production of Major Products and Percent Yield from Crude Run, by Districts

Results in March and first 3 months, 1946, compared with those in like periods last year and in 1941, last prewar year for United States. Figures from Bureau of Mines except data for 1946, estimated with aid of A.P.I., weekly bulletins.

(THOUSANDS OF BARRELS)

DISTRICTS	*Gasoline			Kerosine			Distillate Fuel Oil			Residual Fuel Oil			Lubricants		
	1941	1945	1946	1941	1945	1946	1941	1945	1946	1941	1945	1946	1941	1945	1946
East Coast															
Production, March	6,821	8,432	7,366	713	1,028	1,449	3,328	3,708	4,789	4,176	6,776	7,256	576	719	634
(Daily Average)	220	272	238	23	33	47	107	120	155	135	219	234	19	23	20
Percent Yield from Crude	37.4	36.4	30.9	4.0	4.6	6.2	18.6	16.5	20.4	23.4	30.2	30.9	3.2	3.2	2.7
Production, January-March	18,825	23,948	21,472	2,228	2,636	4,116	10,943	11,817	14,154	12,846	20,861	21,884	1,758	1,935	1,795
(Daily Average)	209	266	239	25	29	46	122	131	157	143	232	243	19	21	20
Appalachian Total															
Production, March	2,026	2,170	2,276	288	313	314	443	576	535	660	824	667	502	433	435
(Daily Average)	65	70	73	9	10	10	14	18	17	21	26	22	16	14	14
Percent Yield from Crude	45.6	43.8	47.7	6.6	6.4	6.7	10.2	11.8	11.5	15.2	16.9	14.3	11.5	8.9	9.3
Production, January-March	5,930	6,339	6,440	865	933	997	1,304	1,664	1,563	2,037	2,562	1,900	1,412	1,161	1,282
(Daily Average)	66	70	72	10	10	11	15	19	17	23	28	21	16	13	14
Appalachian District No. 1															
Production, March		1,405	1,412		261	262		356	332		376	321		403	412
(Daily Average)		45	45		8	8		11	11		12	11		13	13
Percent Yield from Crude		45.7	47.2		8.6	9.0		11.8	11.4		12.5	11.0		13.3	14.1
Production, January-March		4,061	3,846		780	833		1,051	935		1,274	854		1,078	1,184
(Daily Average)		45	43		8	9		12	10		14	9		12	13
Appalachian District No. 2															
Production, March		765	864		52	52		220	203		448	346		30	23
(Daily Average)		25	28		2	2		7	6		14	11		1	1
Percent Yield from Crude		40.2	48.7		2.8	3.0		11.8	11.6		24.1	19.9		1.6	1.3
Production, January-March		2,278	2,594		153	164		613	628		1,288	1,046		83	68
(Daily Average		25	29		2	2		7	7		14	12		1	1
Illinois, Indiana Kentucky															
Production, March	10,575	12,162	11,009	1,072	1,045	1,552	2,051	2,981	3,033	3,860	4,537	4,443	315	410	388
(Daily Average)	341	392	355	35	34	50	66	96	98	125	146	143	10	13	13
Percent Yield from Crude	50.7	49.0	46.1	5.4	4.5	6.8	10.4	12.8	13.3	19.5	19.4	19.5	1.6	1.7	1.7
Production, January-March	30,589	36,229	32,193	3,113	3,067	4,439	6,120	8,911	8,949	11,545	13,951	12,800	941	1,182	1,089
(Daily Average)	340	403	358	34	35	49	68	99	100	128	155	142	10	13	12
Oklahoma, Kansas, Missouri															
Production, March	5,793	6,142	5,874	701	683	893	1,168	1,793	1,863	1,898	2,164	2,110	312	451	465
(Daily Average)	187	198	190	23	22	29	38	58	60	61	70	68	10	15	15
Percent Yield from Crude	53.0	48.8	44.9	6.9	5.8	7.5	11.4	15.4	15.6	18.6	18.5	17.7	3.1	3.9	3.9
Production, January-March	16,104	18,122	17,480	1,831	2,104	2,498	3,361	5,356	5,205	5,264	6,438	6,089	873	1,279	1,303
(Daily Average)	179	201	194	20	23	28	37	59	58	59	72	68	10	14	14
Texas Inland															
Production, March	3,423	3,995	3,820	280	403	479	207	523	445	1,238	1,923	1,685	41	23	26
(Daily Average)	111	129	123	9	13	15	7	17	14	40	62	54	1	1	1
Percent Yield from Crude	52.6	44.8	49.1	5.3	5.8	7.3	3.9	7.6	6.8	23.4	27.8	25.7	0.8	0.3	0.4
Production, January-March	10,096	11,861	11,189	835	1,206	1,357	592	1,583	1,316	3,437	5,843	4,747	96	58	71
(Daily Average)	112	132	124	9	13	15	6	18	15	38	65	53	1	1	1
Texas Gulf															
Production, March	12,405	16,557	15,940	1,917	1,834	3,085	4,769	6,550	7,791	6,784	7,521	7,504	677	911	1,059
(Daily Average)	400	534	514	62	59	100	154	211	251	219	243	242	22	29	34
Percent Yield from Crude	41.9	41.1	40.8	6.8	5.2	8.7	16.9	18.4	22.1	24.1	21.1	21.3	2.4	2.6	3.0
Production, January-March	37,033	47,769	45,944	6,490	5,464	9,223	14,833	19,024	22,451	19,472	22,891	21,122	1,884	2,572	3,013
(Daily Average)	411	531	510	72	61	103	165	211	250	216	254	235	21	29	33
Louisiana Gulf															
Production, March	1,455	3,780	3,750	514	1,132	1,352	640	1,538	2,191	1,079	1,459	1,315	160	189	167
(Daily Average)	47	122	121	17	37	44	20	50	71	35	47	43	5	6	5
Percent Yield from Crude	35.5	42.2	36.1	12.8	13.5	13.8	16.0	18.3	22.4	27.0	17.4	13.4	4.0	2.2	1.7
Production, January-March	4,573	11,010	10,401	1,740	2,863	3,981	1,806	3,967	6,240	3,153	4,145	3,664	407	568	490
(Daily Average)	51	122	116	19	32	44	20	44	69	35	46	41	5	6	5
North Louisiana-Arkansas															
Production, March	992	939	651	266	213	170	186	291	240	595	525	403	58	116	108
(Daily Average)	32	30	21	8	7	5	6	9	8	19	17	13	2	4	3
Percent Yield from Crude	42.2	33.6	28.7	11.7	9.3	10.0	8.2	12.7	14.2	26.2	22.9	23.8	2.6	5.1	6.4
Production, January-March	2,865	2,783	2,064	770	677	398	543	816	668	1,715	1,639	1,129	189	348	325
(Daily Average)	32	31	23	9	8	4	6	9	7	19	18	12	2	4	4
Rocky Mountains Total															
Production, March	1,424	1,937	1,805	74	98	129	206	437	487	649	1,079	1,126	12	6	18
(Daily Average)	46	62	58	2	3	4	7	14	16	21	35	36			1
Percent Yield from Crude	52.8	43.8	42.1	2.9	2.4	3.2	8.0	10.7	12.1	25.2	26.5	27.9	0.5	0.2	0.4
Production, January—March	4,193	5,498	5,170	210	310	396	601	1,192	1,332	1,804	3,250	3,160	51	59	71
(Daily Average)	47	61	57	2	3	4	7	13	15	20	36	35	1	1	1
Rocky Mountains District No. 3															
Production, March		156	186		20	25		27	49		104	144			
(Daily Average)		5	6		1	1		1	2		3	4			
Percent Yield from Crude		47.4	41.9		6.2	6.1		8.4	12.0		32.2	35.3			
Production, January-March		488	490		60	70		81	142		322	397			
(Daily Average)		5	5		1	1		1	2		4	4			
Rocky Mountains District No. 4															
Production, March		1,781	1,619		78	104		410	438		975	982		6	18
(Daily Average)		57	52		2	3		13	14		32	32			1
Percent Yield from Crude		43.5	42.1		2.1	2.9		10.9	12.1		25.9	27.0		0.2	0.5
Production, January-March		5,010	4,680		250	326		1,111	1,190		2,928	2,763		59	71
(Daily Average)		56	52		2	3		12	13		32	31		1	1
California															
Production, March	7,036	9,716	8,579	208	307	334	2,328	2,537	3,486	6,919	12,663	11,653	160	331	242
(Daily Average)	227	314	277	7	10	11	75	82	112	223	408	376	5	11	8
Percent Yield from Crude	34.7	31.5	30.3	1.3	1.2	1.4	14.0	9.5	14.4	41.7	47.6	48.1	1.0	1.2	1.0
Production, January-March	19,756	28,625	24,703	500	701	1,140	6,973	7,427	10,097	20,522	36,903	33,227	667	993	687
(Daily Average)	219	318	274	6	8	13	77	83	112	228	410	369	7	11	8
Total United States															
Production, March	51,950	65,830	61,070	6,033	7,056	9,757	15,326	20,934	24,860	27,858	39,471	38,162	2,813	3,589	3,542
(Daily Average)	1,676	2,123	1,970	195	228	315	494	675	802	899	1,273	1,231	90	116	114
Percent Yield from Crude	43.4	40.8	38.8	5.4	4.8	6.8	13.8	14.3	17.2	25.1	27.0	26.4	2.5	2.5	2.5
Production, January-March	149,964	192,184	177,056	18,582	19,961	28,546	47,076	61,757	71,975	81,795	118,474	109,722	8,278	10,155	10,096
(Daily Average)	1,666	2,135	1,967	206	222	317	523	686	800	909	1,316	1,219	92	113	112

* Production includes straight run, cracked, and natural blended at refineries. Yield indicates percent of crude runs made into straight run and cracked gasoline.

General Features Of Water Flood Systems

Most factors of water flood plant design are no more difficult than problems involved in standard production

DESIGN and operation of the average water flooding plant and system may present the inexperienced flood operator with a host of strange problems, which are described in what seems to be highly technical terms, and infer that the problems are one for a combination chemist and engineer.

This is undoubtedly correct; however, most factors of water flood plant design and operation are no more difficult for any oil operator to absorb than are the problems involved in his standard production, provided he has a suitable basic knowledge of the fundamentals involved.

The average water flood project may be divided into four separate parts for discusion purposes, namely:

1. Water source
2. Treatment
3. Pumping and Transmission
4. Gathering system and separation

Source of water for flooding purposes is a very important factor. The source should be capable of furnishing an unfailing volume equal to roughly five to ten barrels of water per barrel of oil produced, or from approximately two to ten barrels per day per foot of pay sand exposed in input wells, depending on the nature of the sand being flooded. This total requirement will decrease in direct ratio to the amount of recycle water used during the life of the project, but an indefinite supply should not be considered, if possible. Water flooding requirements exert strenuous demands on even the more prolific water-bearing formations and many operations have met formidable economic obstacles when the water source started to dwindle.

Water's Chemical Nature

Equally as important as volume are the considerations which must be given the chemical nature of the source water. Source water of poor chemical composition for flooding requires considerable and constant chemical treatment and supervision if sand pore plugging or material and equipment maintenance are to be minimized.

As a rule, fresh water is utilized for flooding; however, in some locations salt water has been used very advantageously. The source for either is usually drilled wells, with some floods securing water from surface streams or other bodies of water.

Water from supply wells is lifted to the surface by turbine pumps, air or gas jetting, or regular pumps. The former is seemingly the more widely used, inasmuch as air lift may cause corrosion, by dissolved oxygen, and the latter is only suitable for lower volume operations.

Corrosion experienced by dissolved oxygen in flood water may be eliminated by deareation under vacuum (the most common procedure). However, expenditures required for this operation may approach that of turbine lift. Conversely, composition of the source water as it comes from supply wells may be such that sub-surface pump maintenance may enforce air-life adoption. Local conditions govern the choice of this equipment.

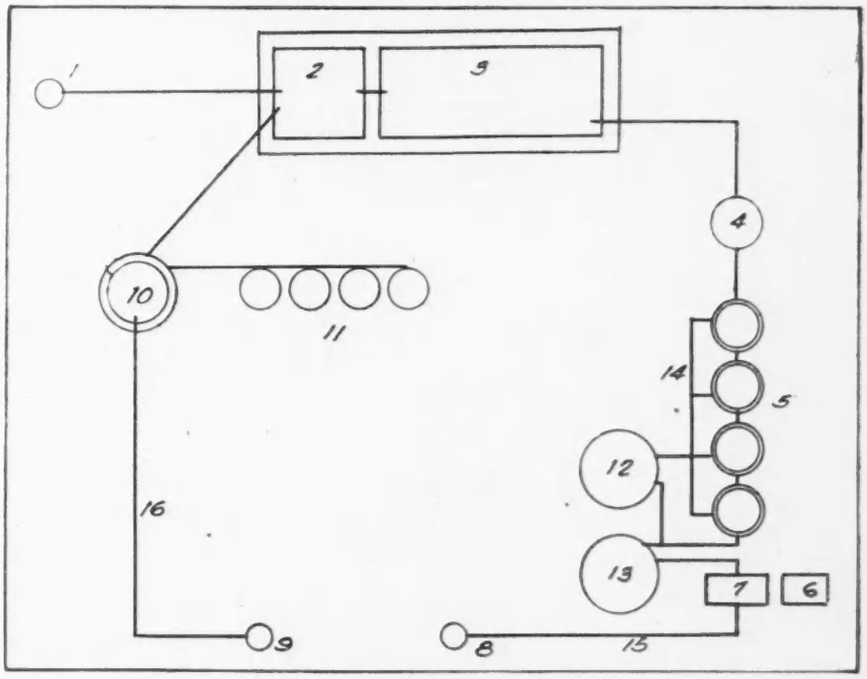
If recycle water is to be used, the source water may be introduced into the settling portion of the supply pit as shown in the illustration. A connecting duct allows this raw water to move into the main supply portion of the pit, leaving oil scum and a portion of the solids in the water in the settling or scavenging portion of the pit. The size of this pit is usually such that it will accommodate and furnish the plant with the major portion of one day's requirements. Thereby failure of either source wells or recycle supply would not interfere with operation for one day.

From the source pit water is moved to treating equipment by pumps or gravity feed. Gravity feed is, of course, very desirable provided topographical relief will permit.

There are a great many types of treating equipment and procedures in use today. A detailed description of each type system is not deemed necessary, but it should be stated that nearly all source waters require treatment before being suitable for injection.

The end point of any and all of the treatment systems *should* be to eliminate all organic growth, reduce turpidity (or suspended matter) to two or three parts per million, keep iron and manganese below 0.3 ppm and make the water as

Typical Water Flood System



LEGEND

1. Source well.
2. Scavenger pit.
3. Source pit.
4. Treating system.
5. Filters.
6. Primary power.
7. Pump.
8. Input well.
9. Producing well.
10. Separator.
11. Oil stock tanks.
12. Backwash supply tank.
13. Clear water tank.
14. Baskwash system.
15. Distribution system.
16. Gathering system.

non-corrosive as is economically possible. To acomplish these items control is usually exerted on oxygen, chlorides, sulfates, iron, hardness, Ph value, turpidity, color, odor and taste. Following treatment the treated water is passed through filters to remove filterable compounds.

Pressure type or open filters are used, with general preference for the former, and have a capacity equalling or exceeding that of the plant. Filter capacity is gauged by the cross sectional area of filtering media exposed to the water. It is usually necessary to put water through pressure filters with a centrifugal pump. This pump may have sufficient capacity to not only pass water through the filters, but also to elevate it into a clear water stock tank after leaving the filters. This clear water tank serves as a source tank for the main pressure pumps.

A variety of pumps is used in flood operations; however, regardless of what types are used they should generally have a continuous pressure duty rating exceeding the value of one pound per foot of depth from the surface to the sand being flooded. In many plants the main pumps are designed wtih a two-pound limit instead of one per foot of well depth. Maintenance and installations costs for different type pumps are easily ascertainable and maintenance costs in properly treated water should not differ from any other like condition operations.

Choice of Power

Multi-stage centrifugal, positive and displacement pumps, of single, duplex and triplex construction (both horizontal and vertical) are used. Power is furnished by motors, gas or oil horizontal engines, full diesel motors and electricity. The choice of power selection is obviously governed by local conditions.

After leaving the plant, water is distributed to water input wells by the loop or main artery type systems, and metered. The latter method is considered the more economical by operators, but certain conditions may require the loop system. It is very important to consider frictional losses in whatever distribution system is installed, due to excessive horsepower requirements to distribute through an inefficiently designed system.

In connection with construction of the distribution system many operators also install the lease gathering system, as burial of both systems is required in most sections of the country. Corrosive return water is usually combatted by use of cement lined pipe.

Separation of oil and flood water usually may be accomplished by introducing the fluid into a plain separator tank and allowing separation by differences in specific gravity. A considerable volume of water is carried in the separator to expedite separation, and excess water may be taken from the separator by an adjustable siphon, which keeps water-oil contact level constant. Emulsions requiring chemical breakdown are the exception rather than the general rule in flooding operations. In some areas, however, manufactured separation equipment is used, depending, however, on local conditions.

After leaving the separator, if recycle water is to be used in the flooding operations, water is piped to the scavenge portion of the supply pit, and the cycle started again.

Postwar Oil Demand

■ CONTINUED FROM PAGE 34

April, a higher rate is indicated. While runs to stills averaged 4,661,000 barrels daily in March, 1946, compared with 4,719,000 daily in March, 1945, the U. S. runs averaged 4,789,000 barrels daily in in the week ended April 20, 1946, indicating that plants were operated at 88.6 percent of capacity. The runs of 4,789,000 barrels daily in the April 20 week this year were greater than the runs of 4,715,000 daily in the week ended April 21, 1945.

Although detailed figures are not here presented on demand for the individual products, an accompanying table shows production of each of the principal products in the first quarter of 1946, 1945, and 1941, by refining districts as well as for the United States. These figures represent a fair index to demand, although production fails to reflect demand to the extent that the products have gone to storage or have been taken from storage to supplement current production. Also, demand for fuel oils is higher than production would indicate, as imports have been larger than last year.

Gasoline Output

U. S. production of gasoline totaled 177,056,000 barrels in the first quarter of 1946, compared with 192,184,000 in the like period of 1945, a decrease of 7.9 percent, but the 177,056,000 barrels for this year was well above the 149,964,000 barrels produced in the initial quarter of 1941. Furthermore, only 7 million barrels went to storage in this year's first quarter, compared with 10½ million in last year's initial quarter. Considering the changes in stocks, it is indicated that gasoline demand in this year's first quarter (1,889,000 barrels daily) was only 6.4 percent less than demand in last year's first three months. Only a few months ago it was generally believed that gasoline demand for 1946 would be about 8 percent lower than for 1945.

Kerosine demand has greatly exceeded expectations. Production in the first quarter averaged 317,000 barrels daily, an increase of more than 40 percent over the 222,000 barrels per day produced in last year's first quarter and comparing with 206,000 daily produced in the first three months of 1941.

Demand does not show this great an increase over last year, however, as production was supplemented this year's first quarter by only 1 million barrels taken from storage, compared with 4 million barrels of storage kerosine used in last year's first quarter. At the beginning of this year an increase of only about 10 percent in kerosine demand for 1946 was forecast. Unexpectedly large exports have forced upward-revision of the earlier estimates.

Distillate fuel oil production was 16.5 percent greater in the first quarter of 1946 than in the like period of 1945. It averaged 800,000 barrels daily, compared with 686,000 daily last year and 523,000 daily in the first quarter of 1941. In addition to production, there was demand for 7½ million barrels that came from storage, but this was less than the 11½ million barrels taken from storage in the first quarter last year. Imports, however, have been greater this year than last. While the above data do not give an entirely clear picture of the trend of demand, they do show that demand is greater than expected, as earlier estimates allowed for a decrease of about 7 percent for 1946. The explanation lies in the heavy demands for naval and merchant marine use and for export.

Residual fuel oil production was 7.4 percent lower in the first quarter of 1946 than in the corresponding period of 1945. It averaged 1,219,000 barrels daily compared with 1,316,000 daily last year and 909,000 daily in the first quarter of 1941. Less was taken from storage, also, the withdrawal having been 4 million barrels against 15 million. However, imports were greater. While residual fuel demand is lower than last year, it is not down by the 15 percent that was expected several months ago. Use by the Navy and merchant marine has been greater than expected.

Lubricating oil production has been running about the same as last year, although demand previously was expected to be down about 10 percent in 1946.

Stocks of Major Petroleum Products Held by Refining Companies in the United States at End of March, Compared with 1941 and 1945

Stocks at refineries, at bulk terminals, in transit, and in pipe lines. Data for 1941 and 1945 from Bureau of Mines monthly reports; for 1946 from weekly reports of American Petroleum Institute.

(THOUSANDS OF BARRELS)

	FINISHED AND UNFINISHED GASOLINE Stocks End of March			KEROSINE Stocks End of March			GASOIL AND DISTILLATE FUEL Stocks End of March			RESIDUAL FUEL OIL Stocks End of March		
DISTRICT	1941	1945	1946	1941	1945	1946	1941	1945	1946	1941	1945	1946
East Coast	21,113	13,631	23,081	1,146	1,938	4,397	7,998	5,159	9,084	8,371	5,337	6,030
Appalachian	3,628	3,917	4,074	139	252	212	350	493	537	521	389	455
District No. 1	.....	2,424	2,887	.....	221	187	.....	394	449	.....	240	220
District No. 2	.....	1,493	1,187	.....	31	25	.....	99	88	.....	149	235
Indiana, Illinois, Kentucky	20,782	23,569	24,150	806	1,325	1,255	2,397	3,382	3,222	2,801	1,801	3,019
Oklahoma, Kansas, Missouri	9,230	9,439	10,198	453	503	389	1,034	1,471	1,513	2,016	1,146	1,072
Inland Texas	2,965	2,566	3,134	141	162	313	188	331	311	1,601	755	654
Texas Gulf Coast	17,061	16,858	15,887	2,190	1,090	1,400	6,291	5,298	4,791	7,376	5,585	4,476
Louisiana Gulf Coast	3,681	5,261	4,562	556	805	427	1,119	1,739	1,339	2,303	1,367	1,004
North Louisiana and Arkansas	853	2,716	1,800	203	304	257	240	725	487	460	181	247
Rocky Mountain	2,493	2,690	2,603	119	122	128	332	331	440	565	582	640
District No. 3	.....	84	120	.....	20	20	.....	17	36	.....	35	32
District No. 4	.....	2,606	2,483	.....	102	108	.....	314	404	.....	547	608
California	17,116	16,800	15,226	971	424	529	10,060	7,800	6,516	56,885	18,308	15,644
Total United States	98,922	97,447	104,715	6,724	6,925	9,307	30,009	26,729	28,240	82,899	35,451	33,241

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Wax Saturations Sands

DURING the routine determinations of oil saturation on cores from a Pennsylvania pool, the extractable material behaved abnormally. Upon examination it was found to be extremely high in wax content. The conclusion was reached that free wax existed in the sand, which was substantiated by tests upon the crude oil. Because of the presence of this wax the oil saturation as calculated by ordinary methods was in error. A method was developed for calculating the true oil and wax saturations of the cores. Wax contents up to 6 percent were found.

Measurements were made upon this crude oil to determine its paraffin point. This temperature was in close agreement with the formation temperature which indicated that the oil was saturated with wax in the formation. This criteria was used as a test on oils from other areas to determine if the condition existed elsewhere. On two other Pennsylvania crude samples the paraffin points and formation temperatures agreed closely. This points to a possibility of appreciable wax saturations and warrants further study.

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THE determination of oil saturation is probably the most important single item in core analysis. In planned secondary recovery operations the margin of profit or loss depends upon the accuracy of this determination. Any factor which would tend to give an erroneous oil saturation should be evaluated. During some recent routine saturation determinations it was found that erroneous oil saturations were being calculated because of the presence of solid hydrocarbon within the sand sample. This paper will describe the experiments leading up to the problem, a method used for determining the true oil and wax saturations, and tests which have been developed to indicate the possibility of the same condition occurring in other formations.

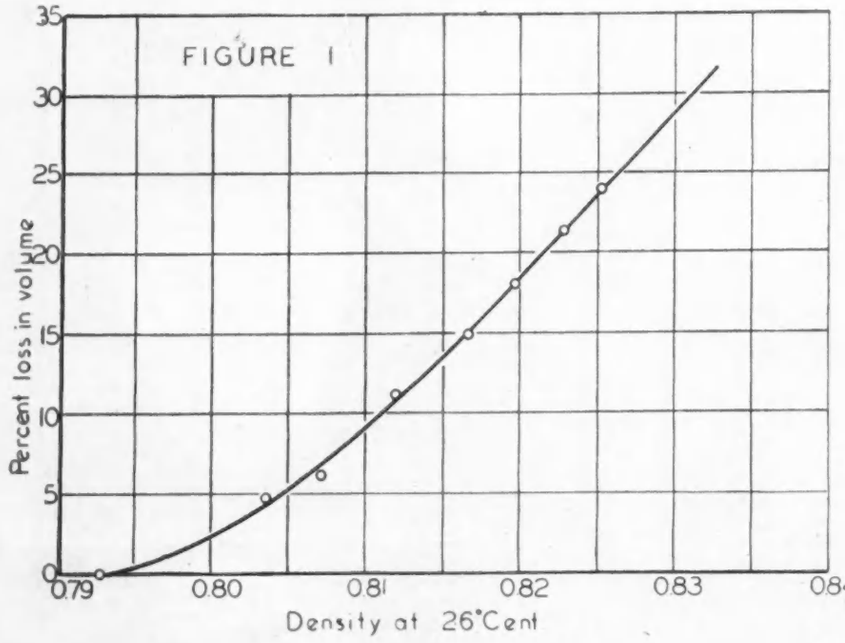
In this laboratory, saturations of oil are ordinarily determined by the extraction-distillation method.[1] By this method the water vapor is removed from the core sample to a trap as in the American Society for Testing Materials water determination and the solvent containing the petroleum hydrocarbons falls back to the extraction flask. The solvent is then distilled from the extraction flask, leaving only a residue of petroleum hydrocarbons. Care is exercised of course to eliminate all solvent from the weight and density of the hydrocarbon residue and the density vs. volume loss residue. In the course of such distillation, light ends of the hydrocarbon will be evaporated, and it will be necessary to correct the volume of the residue for this loss. The data required are the characteristics of the crude oil from the formation in question. The usual weight balance can be employed to check the saturation determinations by this method, the necessary data being the weight of original sample, the weight of dry sample, the volume of water removed, and the density of formation oil.

Ordinarily, the hydrocarbon residue which remains in an extraction flask after evaporation of the solvent is a viscous oil. In the determination of saturations on some samples from the Gaines pool of Pennsylvania the hydrocarbon residue was an amorphous mass resembling petrolatum. Upon slight warming with the hand or with warm water this mass reverted to a homogeneous liquid, and a density was determined with a micropipette. It was reasoned that the residue was solid because the distillation was carried to too high an end point thus oversaturating the oil with wax. However, the oil saturations determined on this basis did not agree with those determined by the weight balance calculation. These values are listed in Table 1.

The differences here were considerably greater than could be explained by the difference in the two saturation methods, and it was felt that the value determined by hydrocarbon residue was in error due to the large amount of wax present. An attempt was made to evaporate a sample of Gaines crude down to a comparable solid residue by submitting it to a treatment similar to that experienced by the oil in the sand sample. Some extraction solvent was added to the oil, the mixture was heated, and the solvent was distilled off. No solid residue was obtained. A straight evaporation loss of 25 percent by volume of the crude oil also failed to yield any paraffin deposit. These facts indicated that the hydrocarbon residue from the sand extraction contained not only the crude oil present within the sand, but also a solid hydrocarbon which was present within the sand. In other words, the oil saturation as measured by routine laboratory tests (either retort or extraction methods) would be too high and as such would lead to predictions of recoverable oil that would be too high.

Predicting Density

Considerations were therefore given to a means whereby the true amount of oil saturation could be obtained and the



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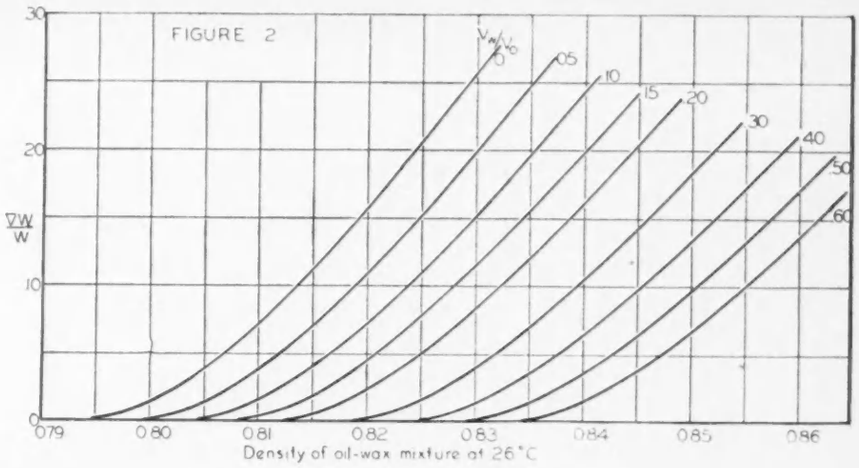
In Oil



actual quantity of solid hydrocarbon within the sand could be evaluated. The chief assumption underlying this calculation is that volumes of oil and wax are additive. It is possible on this basis to predict the density of a mixture if the volume and densities of the components are known. Let the volume of live oil within a sand sample be represented by V_o with a density of D_o, and the quantity of solid wax by V_w with a density D_w. Then the total weight of these substances W is given by

$$(1) \qquad W = V_oD_o + V_wD_w$$

When these substances are removed to the extraction flask and the solvent is evaporated, some of the light ends are lost giving a new volume of oil, v_o with a density d_o. The volume of wax remains constant since no evaporation of it takes place. The weight of the hydrocarbon residue, w, then is

$$(2) \qquad w = v_od_o + V_wD_w$$

The loss in weight involved in the process is equation (1) minus equation (2) or

$$(3) \quad W - w = \Delta W = V_oD_o - v_od_o$$

The fractional loss in weight would be

$$(4) \quad \frac{\Delta W}{W} = \frac{V_oD_o - v_od_o}{V_oD_o + V_wD_w}$$

Also, the density of the hydrocarbon residue is its weight divided by its volume, or

$$(5) \qquad d_m = \frac{v_od_o + V_wD_w}{v_o + V_w}$$

These last two quantities, fractional loss in weight and density of the hydrocarbon residue, are measurable quantities in running the extraction-distillation. There are, however, too many unknown quantities in the equations as they stand to solve for V_o and V_w, the desired quantities. The equations can be made usable by considering the ratio V_w/V_o, volume of wax to volume of oil. Dividing the numerators and denominators of the right hand sides of equations (4) and (5) by V_o, the following equations are obtained.

$$(6) \quad \frac{\Delta W}{W} = \frac{D_o - \frac{v_od_o}{V_o}}{D_o + \frac{V_w}{V_o} D_w}$$

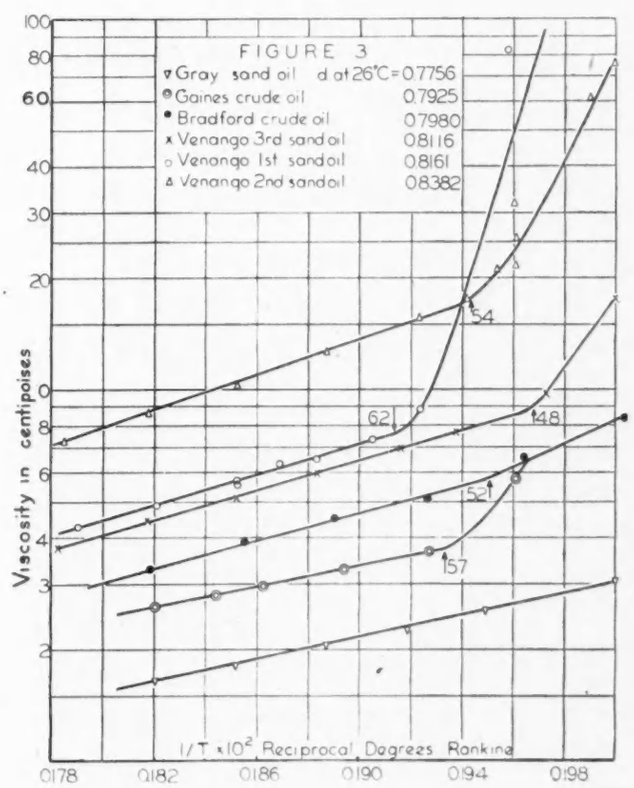
$$(7) \quad d_m = \frac{\frac{v_o}{V_o} d_o + \frac{V_w}{V_o} D_w}{\frac{v_o}{V_o} + \frac{V_w}{V_o}}$$

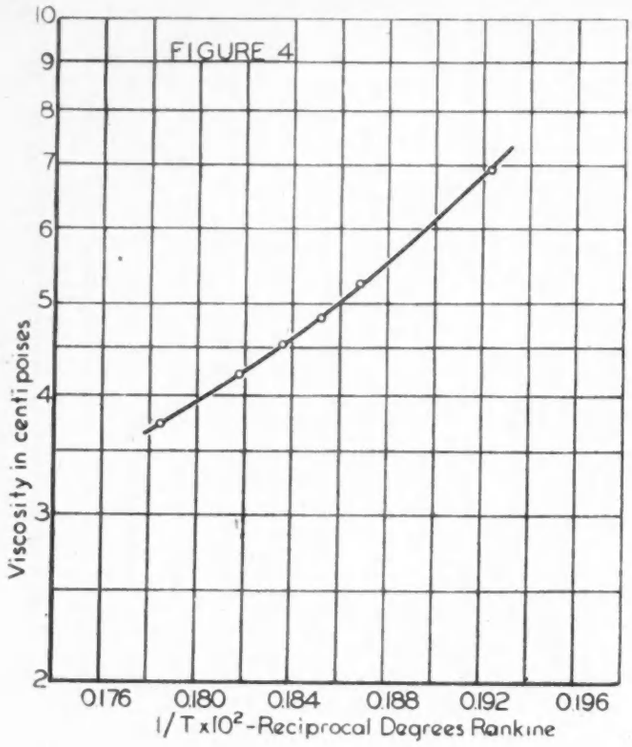
In these two equations the unknown quantities are $\frac{v_o}{V_o}$, d_o, and $\frac{V_w}{V_o}$. If another independent relationship were known between any two of these it would permit solution of the ratio V_w/V_o. A relationship between d_o and v_o/V_o is available from the evaporation characteristics of the crude oil in question. Figure 1 illustrates this relationship for Gaines crude oil. When a sample of this crude oil with the initial density D_o evaporates to a certain fraction of its original volume it has a definite density d_o.

Actually, the best manner to solve these equations is to work backwards. That is, by assuming definite ratios of V_w/V_o and using the relationship of Figure 1, equations (6) and (7) can be evaluated to give fractional losses in weight which correspond to definite densities of hydrocarbon residue. This has been done for Gaines crude oil using a density of 0.900 for the paraffin wax. The results are plotted in Figure 2.

This graph was used to determine valuses of V_w/V_o for the Gaines samples from the experimentally determined quantities, d_m and $\Delta W/W$. This was done by following across the graph along the proper value of $\Delta W/W$ until the proper value of d_m was reached. V_w/V_o was then found by interpolation. The separate quantities of V_w and V_o were calculated by using this ratio of V_w/V_o and equation (1), which is also a known relationship between V_w and V_o. This gives two separate equations for solving the two unknowns. V_o and V_w divided by the pore volumes of the samples give the true oil and wax saturations.

The results of these calculations are given in the last two columns of Table 1. It will be seen that there is an appreciable wax saturation and that the oil saturation values have been lowered considerably from those reported by routine measurement. This oil satura-





tion should not be considered as completely mobile crude which can be moved by a flood. The presence of the wax will immobilize a good fraction of the oil in the form of a complex solid in which oil is being held between crystals. The extent of oil immobilization will depend upon the distribution of the wax in the sand. It would be too optimistic to hope that it is plated out as a film of hard wax on the capillary walls leaving all the oil free to move. The presence of a wax-oil complex should greatly affect the recovery process.

The sand in these samples was very dark even after their very thorough extraction. In order to check the completeness of the extraction and to test for presence of bitumen-like materials in the sand, sample T-2 was given an extraction with carbon bisulphide, a standard solvent in bitumen extractions. The solvent became only slightly discolored and after evaporation the residue was 0.018 grams from 136 grams of sand, a negligible quantity from the standpoint of saturations.

It was pointed out that the chief assumption underlying the calculation of the amount of wax saturation was equation (1). Actually this equation is not true. Wax upon melting or upon going into solution undergoes an increase in volume. Consequently, when a given volume of wax is added to a given quantity of oil the resulting density will be less than that calculated by means of the equation. The second assumption used was that the evaporation loss on a wax-oil mixture would be similar to that of the oil alone. This is not strictly true, because as the ratio of wax to oil increases wax deposits from solution upon evaporation. These factors if taken into consideration would tend to increase the wax saturation values. Therefore, the values calculated are too low. No doubt an increase of from 5 to 10 percent wax saturation above that listed would not be excessive.

Hydrocarbon Deposits

The question arises as to the manner in which solid hydrocarbons might have been deposited within the sand and a manner in which such a situation might be rapidly recognized. Preckshot and coworkers[2] reported work on the presence of asphalt in the colloidal state within crude oils and have shown the possibility of deposition by the electrokinetic effect. The quantity of wax present according to such a mechanism ought therefore to be some function of the flow. Inasmuch as the Gaines field has been under production for over 45 years and has been primarily depleted, wax from this source would be possible.

Another possible mechanism by which the wax could have been deposited would be a lowering of pressure and temperature and a loss of solvent. If the formation had been buried at a greater depth when the crude entered it than at the present time, the original formation temperature and pressure would have been greater than at the presentime. By subsequent erosion of the overburden the formation would be brought closer to the surface. This would (1) reduce the temperature of the formation, and (2) allow loss of the lighter fractions of the crude oil. Both of these changes are in the direction necessary to precipitate solid hydrocarbons, the first by reduction in solubility and the second by a loss of solvent. A third mechanism by which the wax might be present would be the actual synthesis of high molecular weight compounds by direct chemical action. This is quite improbable.

TABLE 1

Sample No.	Permeability	Oil Saturation		True Oil Saturation Percent	Wax Saturation Percent
		By Weight Balance Percent	By Hydrocarbon Residue Percent		
T-17	2.10 mds.	30.4	47.3	28.8	1.5
T-2	70.5	29.0	36.6	24.6	4.0
T-13	83.0	28.9	37.4	24.1	4.5
T-5	123.5	26.3	41.5	19.9	5.6

Wax and Permeability

An interesting correlation from this standpoint is noted between permeability and wax saturations of the samples (see Table 1). The amount of wax found increases directly with permeability. This might occur by the electrokinetic phenomenon or by a straight filtering action, flow being of a greater volume through the higher permeability sands. On the other hand, if the higher permeability sands contained a greater initial oil saturation (less original connate water) the amount of wax should also be greater.

Since the Gaines pool is a depleted reservoir one might question whether the wax found now was present within the sand when the pool was virgin or whether the wax is present as a result of events following the tapping of the pool. The query cannot be answered in a definite manner but the following considerations point to the first alternative. During the drilling of a test well in the Appalachian fields, saturations were run on drill cuttings. These were virgin cuttings and on a sample from a depth of 270 feet there was obtained in the saturation test a hydrocarbon residue similar to those obtained from the Gaines cores. The occurrence of the phenomenon in shallow formations is good supporting evidence, because similar trains of events have taken place in deeper reservoirs without the appearance of any paraffin within the sand. Bradford is an example. Furthermore, the author of an early report on the Gaines field[3] mentions a possible wax content of the sand body and reports the amount of paraffin trouble as excessive. Low rates of production were reported from the wells in the field, a fact that is explainable in part by low permeabilities or broken sand, but also might be due to the immobilization of crude as mentioned earlier.

Where solid hydrocarbon exists within an oil reservoir in conjunction with the crude oil, the crude should be saturated with respect to that hydrocarbon at the formation temperature. If the paraffin point of a crude oil and the formation temperature were the same it would be supporting evidence for the existence of free solid and would offer a test in a new area to determine if wax saturations might be a problem. Comparison of formation temperatures and paraffin points of the crude was made, therefore, for Gaines and other pools

Determining Paraffin Point

The method used for determining paraffin point is based upon viscosity characteristics. The following relationship between temperature and viscosity of liquids can be arrived at theoretically:

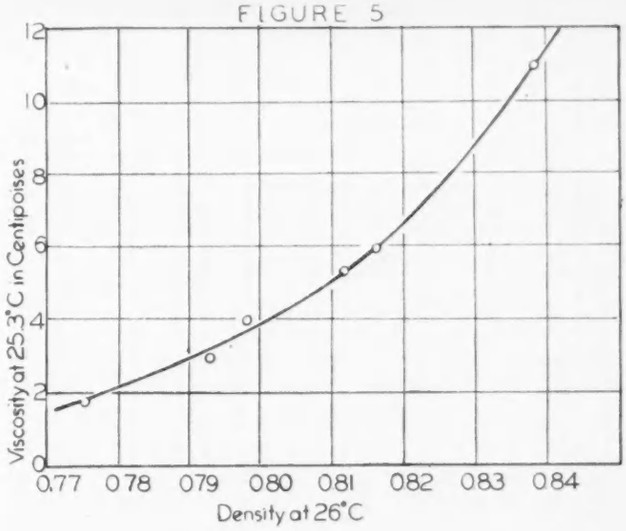
$$\log \eta = \log A + B/T$$

where T is in degrees absolute and η is in centipoises. Experimental data have verified this equation as being quite general for liquids. With a crude oil the relationship should hold so long as the oil is a homogeneous fluid. As soon as any colloidal particles form or solid

matter is suspended a departure from the linear trend should be noted. The temperature of departure should be that at which the oil is saturated with the solid hydrocarbon, i.e., the paraffin point. A gradual departure rather than a sharp break might indicate the existence of colloidal particles and a sharp break might indicate the precipitation of larger wax particles.

The necessary data for the above relationship were collected for a number of crude oils. The experimental setup consisted of a viscometer with the proper discharge constant to cover the range of viscosities, a water bath maintained at a constant temperature throughout the measurement, a stopwatch for measuring the time of efflux, and a density balance for determining the density of the oil in question. Absolute viscosity was thus measured at a series of temperatures, the measurments of a particular sample being conducted with a minimum of evaporation. The results of these measurements are given in Figure 3 for six separate Pennsylvania crude oils. In Figure 4 similar data for an Oklahoma oil from a formation containing some so-called "black" sand is shown. All of the oils tested, excepting one, gave a departure from linearity within the range tested, which point of departure is recorded as the paraffin point for that particular oil. For the Pennsylvania crude oils the breaks are rather distinct, but for the Oklahoma crude the breaks are less distinct indicating that the solid material present might be more in the colloidal state. Table 2 lists the Pennsylvania crude oils, their densities at 26° C., their paraffin points (for this density of oil only) and the slopes of the semi-logarithmic plots.

FIGURE 5



The best source of formation temperature would be direct measurement of those temperatures in the wells by some physical means. This has been performed in only a few of the wells in question and in some instances in neighboring wells. This portion of the work was performed by the staff of the U. S. Bureau of Mines field office at Franklin, Pa. The values for the wells in question as given by them are listed in Table 3. The next best source would be a knowledge of the temperature gradients within the region. Such information is available from government temperature surveys on deep wells.[4] In particular, various gas wells to the Oriskany sand in northern and western Pennsylvania and southern New York have been surveyed. From these measurements it has been demonstrated that the variation of temperature with depth over small ranges can be represented linearly. The equation would be $y = a + bx$, where y is the temperature at the depth x, a is a constant equal to the caluculated mean surface temperature and b is a constant equal to the rate of increase of temperature with depth. For a well at Watrous, Pa., the values determined for a and b by a government survey are $a = 49.31$ and $b = 0.01060$, and for a well in Butler County, also government-surveyed, the values are $a = 48.95$ and $b = 0.01166$. The first set of constants has been used to calculate the formation temperature for the Gaines pool and the Bradford pool; the second group of constants has been used for the Gray sand and the Venango sands. It is realized that there are other factors that should enter into these calculations, such as the surface temperature at the point of interest and the topography over he region.[4,5] Nevertheless, direct calculations with these constants should give approximate values.

FIGURE 6

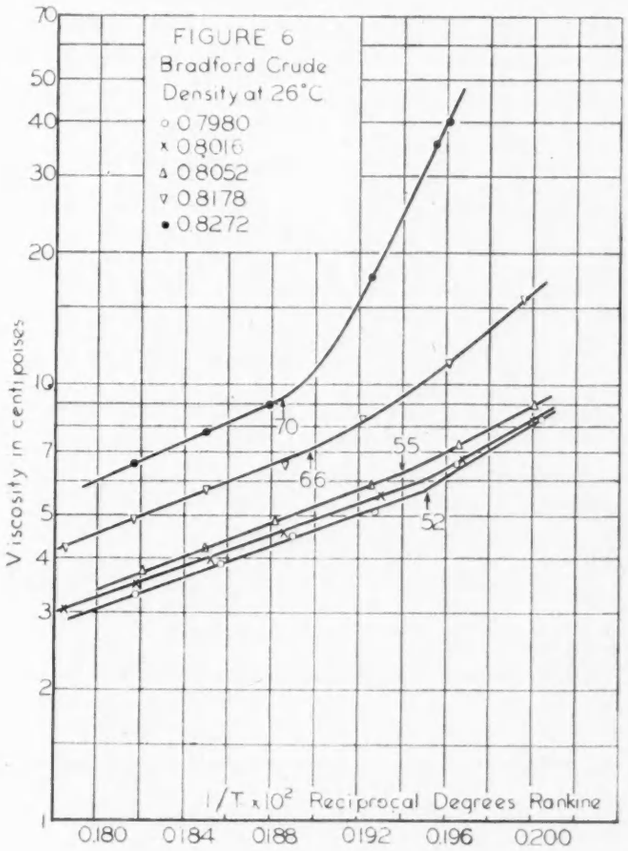
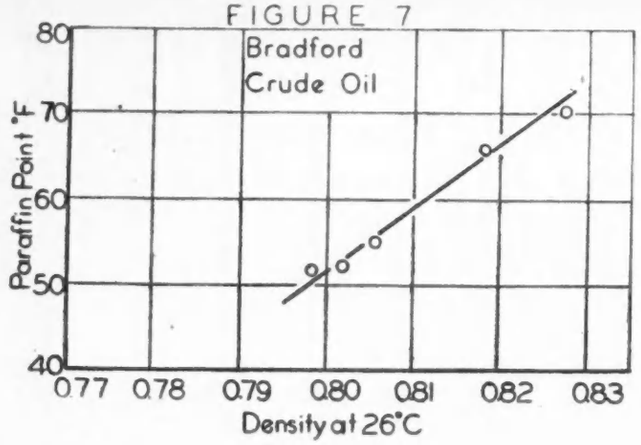


Table 3 gives the depths of the various formations from which the crude was obtained, the determined paraffin points, the measured formation temperatures and the calculated formation temperatures. From this data it is noted that there would be reason to suspect solid paraffin in the sand in three of the instances. These are the Gaines pool, where the presence of wax has been demonstrated, the First Venango sand, and the Second Venango sand.

Fresh core samples from the First or Second Venango horizons in the areas from which these crude samples were taken have not been available yet for extraction in order to verify the presence of wax. In many secondary recovery projects in the middle district, recoveries have not substantiated the high oil saturations reported by core analysis. If wax were present this would happen.

A possible error in these comparisons of formation temperatures and paraffin points could arise from the condition of the crude sample. It is desired to know the paraffin point of the crude under reservoir conditions, but the oil samples received were surface samples. Possible changes from reservoir conditions could

FIGURE 7



arise by (1) loss of dissolved gas and light ends, (2) loss of paraffin from solution. Since the wells under consideration were in depleted pools under negligible pressures and with very small amounts of dissolved gas the first of these factors can probably be neglected. It is known in many of the pools cited that the second factor is important. Paraffin trouble is common experience among Pennsylvania operators, the usual trouble arising from the passage of the produced oil through a cold zone. If wax were lost from the oil during production the recorded paraffin point would be lower than it should be. For this reason if the paraffin point comes within a few degrees of the formation temperature, further investigation is warranted.

The question might also be raised of whether the paraffin points found could be correlated with any other property of the crude oils. There appears to be no regularity of the paraffin points with either density or viscosity. As a matter of fact, about the only correlation that can be noted from the data of Figure 3 and Table 2 is the regular increase of viscosity and the slopes of the lines with density. Figure 5 shows the former of these more clearly. A regularity of paraffin point with density can be demonstrated, however, with one crude oil as it is evaporated to varying degrees. This behavior is illustrated in Figure 6 for Bradford crude oil. This sort of relationship would provide one with a means of correcting for the first source of error mentioned above. That is, if one knew the density of the oil in the formation, its paraffin point could be determined by extrapolation of the relationship shown in Figure 7, which is a cross plot of Figure 6. It is interesting to note that the only oil listed in Figure 3 whose paraffin point falls in with this trend is the First Venango crude oil. Another interesting correlation (but not necessarily a pertinent one at the present time) was obtained from the data in Figure 6. It relates the change of paraffin point to amount of evaporation. This has been plotted in Figure 8. It would be of interest in handling crude oils or it might be used in place of Figure 7 to correct the paraffin point for evaporation loss between the formation and the surface.

TABLE 2

Crude Oil	Density at 26° C.	Paraffin Point °F.	Slope $\frac{\Delta \text{Log}_{10}}{\Delta \text{Log } 1/T}$
Gray sand	0.7756	below 40	14.60
Gaines sand	0.7925	57	13.50
Bradford sand	0.7980	52	18.58
3rd Venango sand	0.8116	48	20.25
1st Venango sand	0.8161	62	20.50
2nd Venango sand	0.8382	54	23.70

TABLE 3

Crude Oil	Depth of Formation, Feet	Formation Temperature		Paraffin Point
		Measured	Calculated	
Gray sand	900	....	59.5	below 40° F.
Gaines pool	769	60.0	57.4	57
Bradford sand	1809	....	65.4	52
3rd Venango sand	636	56.5	56.4	48
1st Venango sand	585	56.0	55.8	62
2nd Venango sand	837	58.5	57.6	54

Summary

To summarize: (1) Sand samples from the Gaines pool of Pennsylvania were extracted and were found to contain solid paraffin wax. A method was developed to calculate the true oil and wax saturations. By this method, the wax saturations were calculated as high as 6 percent. Considerations indicate that this figure is still too low. It is suggested that this amount of wax would not only hinder the correct determination of oil saturation, but also would affect the production mechanism.

(2) Determination of paraffin point of Gaines crude oil and of the formation temperature show them to be identical within error of determination. This fact indicates the reservoir crude to be wax saturated.

(3) Paraffin points on five other Pennsylvania crude oils were determined and compared with the formation temperatures. In two instances, the First and Second Venango sands, there is evidence that the crude oil might be saturated at the formation temperature, in which event solid paraffin might be present.

(4) It is suggested that the simplest means by which the presence of wax in these formations could be explained would be by erosion to bring the producing horizon to a depth where the temperature fell below the saturation temperature. It is further suggested that in view of the history of the Gaines pool the wax was present at the time when it was a virgin reservoir.

Acknowledgments

The writers give acknowledgment to the Bradley Producing Company, Wellsville, N.Y., for their help in furnishing material from the Gaines pool and for permission to publish the core data therefrom; to Robert Bossler of Brundred Oil Company for samples of the middle district crude oils; to the U. S. Bureau of Mines field office, Franklin, Pa., for determination of temperature data; and to the Penn Grade Crude Oil Association for financial aid to a portion of this research work.

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[4] Van Ostrand, "Temperature Gradients," Problems of Petroleum Geology, A.A.P.G. (1934), p. 1017.

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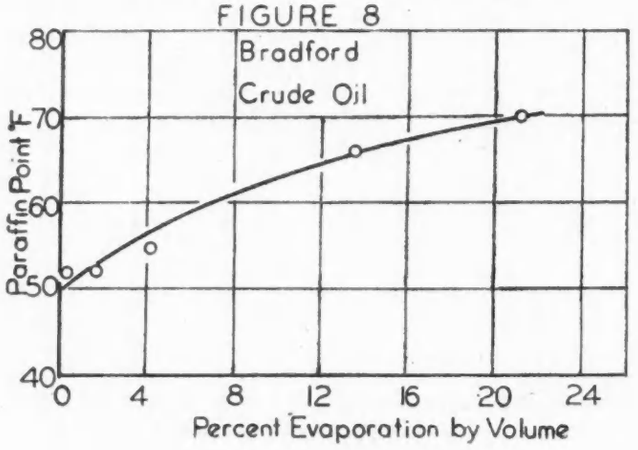
Geophysicists Meet

The Society of Exploration Geophysicists held a one-day regional meeting April 25 at Houston. Approximately 300 geophysicists and geologists were present to hear 14 technical papers presented. Henry Cortes, retiring president, talked on the importance of publishing case history papers, while Cecil Green, newly elected vice president, began consideration of next year's meeting in the Southwest. Dr. J. J. Jakosky, incoming president of the society, was unable to be present at this meeting.

FIGURE 8



Measuring ENGINE HORSEPOWER

By J. L. JOPLIN
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FOR some years operators of gas engines have used a vacuum gauge to synchronize engines and to determine the approximate horsepower an engine is developing. It is now well established that a definite relationship exists between the absolute pressure, or vacuum, in the intake manifold of an engine and the power developed by the engine. Many tests have been conducted on this subject and much evidence gathered.

Probably the earliest tests within the oil industry were conducted in California by a group of engine distributors and oil company operators. After running many tests with a vacuum gauge and various portable dynamometers, they plotted manifold vacuum vs horsepower and drew curves at various speeds: viz, 600, 700, 800, 900, and 1000 revolutions per minute. Unfortunately they discovered that a curve plotted on a given make and size of engine under conditions existing at that time would not necessarily hold true for an exactly similar engine operated under a different condition or at a different location. It was also found that, even on the same engine, test data gathered one day might not hold true several days later. It was also found that, even on the same engine, test data gathered one day might not hold true several days later.

Not True Yardstick

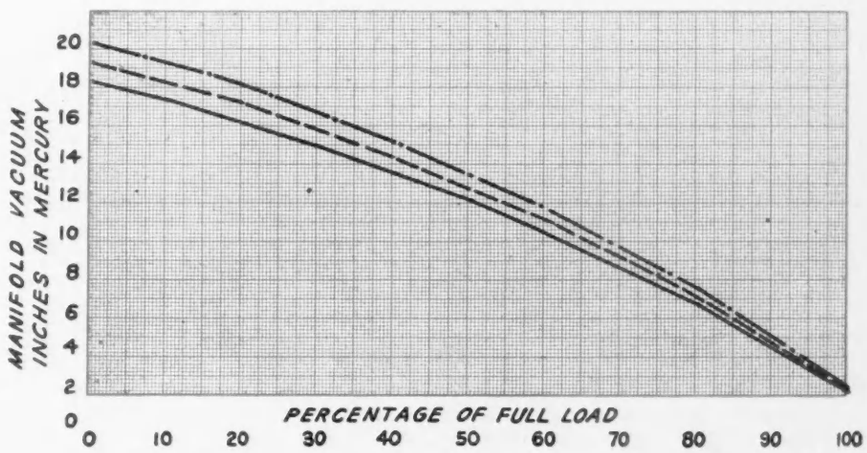
The apparent conclusion of the various investigators was that while manifold vacuum was a good approximate yardstick, it would not serve to determine the definite horsepower developed by the engine. Obviously, this conclusion was a reasonable one, since differences in altitude, atmospheric pressure, operating temperatures, British Thermal Unit content of the fuel, etc., would cause one engine to vary from another.

Later on, in 1936, examination of literally hundreds of these tests revealed that they had stopped just short of the goal; that while manifold vacuum cannot be used to exactly determine the horsepower developed by an engine, it will give an almost perfect indication of the *percentage of load* that the engine is carrying.

By combining all the data available, one empirical curve was developed by plotting vacuum vs percentage of maximum load. The data indicated that by taking readings at operating speeds, both without load and under load, it is possible to determine fairly accurately the *percentage* of maximum power that the engine is developing.

This method eliminates the necessity of considering atmospheric temperature, atmospheric pressure, BTU content of the fuel, and other such variables. If necessary to express the load in horsepower, a close approximation can be obtained by referring the percentage figure obtained to The API "standard power unit maximum horsepower curve."

FIGURE 1
Manifold depression curve



R.P.M.	HP-217	HP-326	K-428	BTH	L-525	FRH	JL-877	MO-893	JL-1335	PC-1879
600	13	22	27	33	34	42	65	68	92	132
700	16	26	32	39	40	48	75	80	106	156
800	19	30	37	44	46	55	85	92	122	178
900	22	34	42	48	52	60	93	104	136	196
1000	24	38	47	52	57	65	100	115	149	210
1100	27	42	52	....	63	....	....	126	....	....
1200	30	46	57	....	68	....	....	135	....	....
1300	33	48	62	....	73	....	....	143	....	....
1400	35	52	67	....	78	....	....	150	....	....

Full Load H.P.

A basic curve was drawn beginning at 18 inches mercury of vacuum at no load, to a point represented by two inches mercury of vacuum at 100 percent of load. Alternate curves were drawn from 19 and 20 inches vacuum at no load, to the same full-load point. This curve is illustrated in Figure 1. For purposes of easy calculation of approximate horsepowers, (when desirable) The API complete power unit ratings of various size engines are given.

Example Given

Example: If, on an engine in peak condition, manifold depression of 18 inches mercury is observed at 900 rpm under conditions of no load (except for fan and normal accessories), and 8 inches mercury vacuum is observed when load is applied, then the engine is delivering 71.5 percent of the maximum brake horsepower that it can develop at 900 rpm under the operating conditions then applying as to fuel, cooling water, lubricating oil, atmospheric temperature, and atmospheric pressure. (Expressed in horsepower, this means that an 877-cubic inch engine would be carrying 71.5 percent of 93 hp at 900 rpm or 66.5 hp). If the speed is changed to 700 rpm, the initial—or no load-vacuum—will remain approximately the same (18 inches mercury), and if a load is then applied until the manifold depression reaches eight inches mercury, then the engine will be developing 71.5 percent of the maximum brake horsepower obtainable at 700 rpm under the conditions prevailing (or 71.5 percent of 75 hp which equals 53.5 hp).

If the engine should have 19 or 20 inches of vacuum at no load, the corresponding curve should be used. For other no-load vacuums the points can be readily interpolated.

At the time the data was originally assembled, there seemed to be considerable evidence that if the initial no-load vacuum decreased due to wear of the engine, its ability to carry a load would fall in direct proportion. Subsequent tests have not borne out this assumption, and therefore these tentative data have been withdrawn from the curve. It is believed that this portion of the procedure will bear more exhaustive investigation.

In the majority of instances there is no need to know how much horsepower the engine is using. Some method of determining to what degree the engine is

FIGURE 2

Graph showing horsepower requirements through the complete 360-degree cycle of the well pump on both lifting the well and lifting the weights, on a 57-inch stroke at 16 strokes per minute.

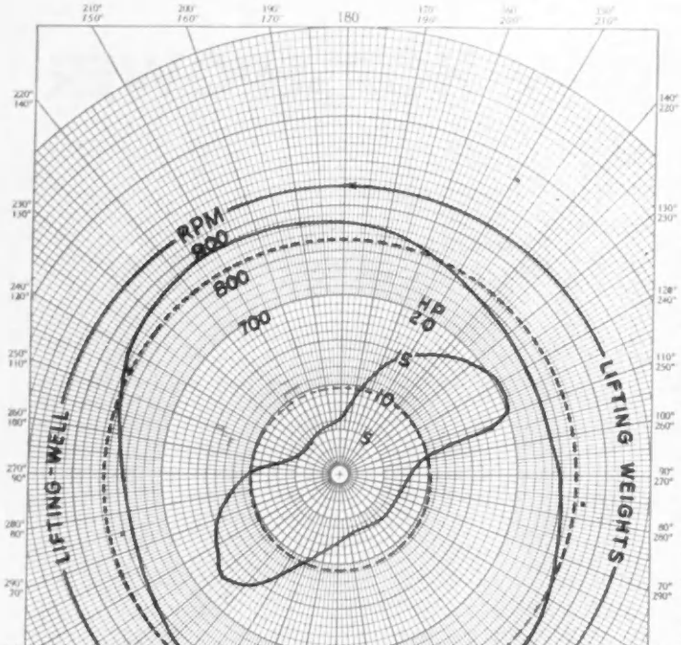
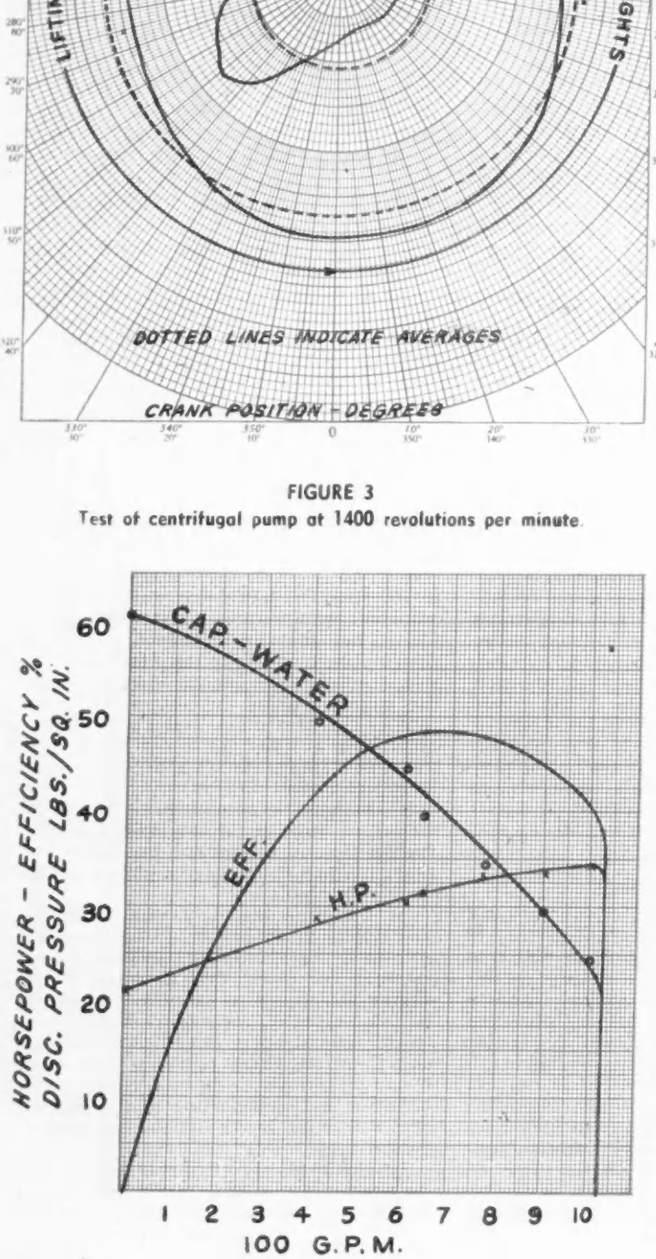


FIGURE 3

Test of centrifugal pump at 1400 revolutions per minute.



loaded, however, is definitely needed by the industry, and manifold vacuum will give these data positively.

The manifold-depression system of testing can be applied only as a means of obtaining approximations. In most field tests the only information actually required is the relative ability of an engine to do a specific job and its possible reserve capacity to accommodate an increase in load. Results obtained from manifold-depression testing are sufficiently accurate for practical purposes, and can be compared to determinations obtained from a five-inch slide rule. Although amazingly accurate results sometimes can be secured, it should be remembered that if exact information is desired, standard laboratory methods of procedure should be used. The vacuum gauge and the hand tachometer do not constitute a portable dynamometer.

Other Uses

Another good use of manifold vacuum is to equally divide a load between two or more engines as, for example, parallel engine-generator sets. Special throttles for this purpose have been developed and found to be very satisfactory. This principle is also used by the aviation industry to divide loads between engines on multiple motor planes such as the Flying Fortress and B-29. In this case the engines are supercharged and the manifolds are under a positive pressure, but the same principle applies inasmuch as the relationship is one of absolute pressure.

Another practical application of the system is to assist in counterbalancing a beam pumping unit. As soon as the vacuum gauge is attached to the intake manifold, it will be noted that the readings vary widely in direct relation to the position of the crank. Experimentation with various quantities and positions of counter weights will determine what combination gives least variation of the needle during the pumping cycle, and this condition indicates that the unit is most perfectly balanced.

By taking observations of the manifold vacuum at various positions of the crank (usually 16 equally spaced points), it is possible to draw a curve such as shown in Figure 2 and to calculate the approximate horsepower being delivered by the engine at any position of the crank. Of course, it is necessary to observe the engine speed with a tachometer at these same points, and the speed curve also becomes indicative of the conditions prevailing on that pumping well. In order to facilitate taking such readings, a simple electrical contactor, utilizing dry batteries and flashlight bulbs, can be made up and hooked to the crank of the pumping unit. The flashlight bulb is placed in a little cup arrangement that will cover the face of the vacuum gauge and the tachometer. Observations are taken through a peephole and the needle can be checked by stroboscopic effect. By moving the contactor through the 16 points of the compass, the data may be easily gathered.

Mechanics have come to recognize the vacuum gauge as the most useful tool in their kit. It is an axiom with all good mechanics that the vacuum gauge is necessary to make the load adjustment on the carburetor. Again, the procedure is simplicity itself—simply move the adjustment until the vacuum reaches the highest possible point under load.

Conditions such as weak cylinders will show up in the tell-tale needle of the vacuum gauge, and the best possible spark advance is also easily determined by this means.

One very interesting use is recalled of a vacuum gauge on seven engines of the same model driving identical size and style pipe line power pumps. In this station it was found that while operating pressures were exactly the same and the pump and engine speeds were identical, the manifold vacuum under load varied widely from engine to engine. The operator then decided to check the pumps and was amazed to find leaking pump valves, poor packing, and other pump conditions that accounted for the difference. When these troubles were remedied, the output of the station was increased about 12 percent without the additon of other pumping equipment.

The vacuum gauge has been used in innumerable other ways. Figure 3 illustrates a centrifugal pump curve that was developed through the vacuum gauge and other simple instruments. In this case the operator had lost all records of the pump characteristics.

A test was run using a Pitot tube installed in a calibrated joint of six-inch pipe. The discharge pressure was measured by a test gauge installed at the discharge flange of the pump. The pump suction was flooded from a tank directly flanged to the pump, the tank having a water level barely covering the pump intake. The engine speed was measured by an indicating tachometer, and the approximate engine horsepower was measured by means of a vacuum gauge. The head-gallon characteristic and the horsepower curve were determined by test data, so the pump efficiency could then be calculated.

over the famous Ashley Planes

AMERICAN EXCELLAY PREFORMED TIGER BRAND Wire Rope sets records for top performance over 100 year period

WILKES-BARRE in the heart of the Anthracite field is three miles from Ashley, Pa., where the Ashley Planes are located. From Ashley to the mountain top it is 1,000 feet up. The grade of the famous Ashley Planes is such that a locomotive cannot negotiate it economically. The alternate route around the mountain is 12.41 winding miles of heavy grade over which a locomotive can haul a small tonnage train at slow speed. With brilliant foresight the engineers who planned the Ashley Planes 100 years ago, chose to do it the hard way. They proposed to haul freight cars up Solomon's Gap, on three inclined planes—*by wire rope.*

As revolutionary as this project must have been in 1843, the remarkable fact is that repeated tests prove it to be more economical than the longer route, even today. Under twenty-four hour operation, hauling an average of one million tons of coal, oil and mixed freight per month—this cable-hauled railroad equipped with about 100 tons of wire rope reduces transportation costs very materially.

Best visualized by the profile reproduced at left, the Ashley Planes, now operated by the Central Railroad of New Jersey, consist of three inclines of 5.7%, 14.65%, and 9.28% grade respectively. The total rise is 1,035.9 ft. up which 35 to 45 cars are hauled hourly at from 12 to 30 mph.

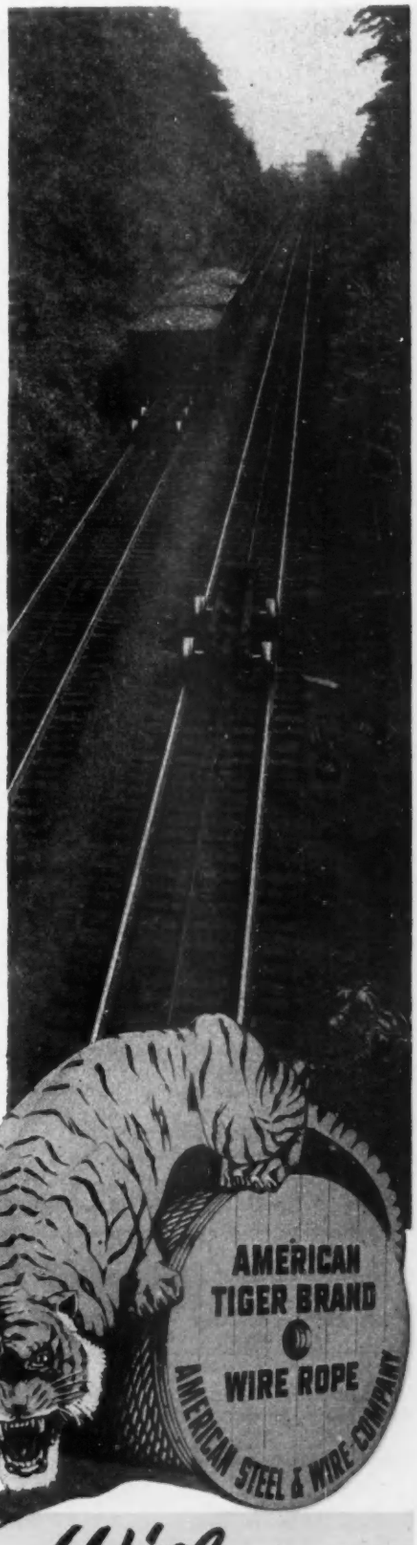
Each plane is a self-contained unit. It consists of a double track (with a truck pit at the foot of each track), and is equipped with its own hauling cable and two cable trucks or "barneys". A power house with hoisting engine at the head of each plane furnishes the motive power.

The hauling cable (2½" diameter on the top and bottom planes, 2¾" diameter on the middle plane with the heaviest grade) passes from one barney up the plane over supporting pulleys, then around 24-ft. diameter twin traction drums, then out through the bottom of the power house and back to the barney on the parallel track.

Close check is kept on the life of these hauling cables, and is measured in terms of tonnage hauled. We believe it significant that during the years when the planes were under full wartime capacity operation, and the equipment was being worked to the limit, American TIGER BRAND Excellay Preformed Wire Rope ran up the highest tonnage performance ever recorded! 19,804,642 tons on the No. 2 plane; and 27,972,495 tons on the No. 3 plane.

TIGER BRAND Excellay Preformed Wire Rope installed on the No. 3 plane in November 1943 has to date hauled 27,972,495 tons and is still in excellent condition. The performance of these ropes continues to break previous records.

These figures — substantially better than the former best with other wire rope used—speak for themselves as proof of the superior stamina, greater ruggedness and better service TIGER BRAND delivers, wherever used.



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TIGER BRAND *Wire Rope*

Effective Management

Part 4

Wage and Salary Administration

By G. M. FITZGERALD
Card, Fitzgerald & Leghorn, Management Consultants—Engineers

IN MANY business organizations the administration of wages and salaries is handled in such a way that it creates excessive labor cost and produces discontent and hurts morale. Too often individuals' salaries and wages are subjects of approximation and opinions. In such cases they are administered without any systematic consideration of their importance, but made only when urged or forced. And, too often, it is the "griper" who gets the raise rather than the competent, uncomplaining employe. A sound, fair wage program properly developed will assure that the company's wage policy is on a sound competitive basis in the community, and it will save the executive's time in administering the pay schedule by reducing individual employe grievances and improving overall morale.

A sound salary and wage policy, administered with fairness, improves the overall morale and cuts down grievances

Such a program consists of three definite steps: (1) Job analysis and description, (2) job standardization, (3) job evaluation. The term "job evaluation," has been rather carelessly used in the past to cover all phases.

Job Analysis

Job analysis is an old and proven method of assembling, recording and analyzing the pertinent facts essential to each job. It is one of the most valuable management tools for the administering of sound industrial relations. In each company it first must be determined what essential job factors are common to, and affect all jobs with the company. In broad terms, these job factors are usually skill, physical effort, working conditions and responsibility. However, these terms are usually much too broad to enable a close analysis of all the jobs in any given company. Thus, it is important that the particular factors affecting the company or industry be considered. For instance, in one company, accident and health hazards may have considerable bearing on certain jobs. In this case, they must be considered in all fairness, and each job analyzed in the light of its hazards. In another company, there may be relatively no accident and health hazards, and there would be no point in analyzing the jobs for such a factor. While a better analysis can be attained by breaking the job down to the greatest number of factors, they must also be considered from a practical viewpoint. Generally, 10 to 14 factors are sufficient for a careful analysis, where possibly the factors should be based on functional data rather than opinion. A careful job analysis takes time to do a thorough job. Often, considerable time can be saved through the use of the carefully prepared job questionnaire. Such a questionnaire, handled by skilled technicians, can bring out the important points concerning each job factor and at the same time give the employe a voice in the job study. Such employe participation is often helpful in selling the plan. During the analysis of individual jobs it is invariably discovered that some jobs, both in laboring grades and in the higher salaried grades, are indefinite as to their scope of activity and the limits of their responsibility. This is one of the really valuable features of a concise job analysis.

Job Descriptions

Job descriptions are developed upon the completion of the analysis, to outline the requirements of the job in relation to each factor previously analyzed. It is important to remember that from this point on it is the job requirements rather than the individual employe's abilities that are being measured. Once the job is analyzed, defined and evaluated, it becomes an easy matter to determine whether an employe fulfills the job qualifications.

Job Evaluation

In job evaluation, the primary purpose is the determination of the relative value of one job to another within a given organization. Much has been said about the scientific approach and the newness of job evaluation. This is not particularly true, because wages and salaries have always been determined by the relative importance of one job to another. Job evaluation does present proven principles that when consistently and fairly applied greatly eliminate individual opinions. The actual mechanics of evaluation may vary from the simplest form of ranking by merely placing the jobs ranging in order of least importance to the most important, to the more exacting methods of evaluation that give a quantitative evaluation based on the considered importance of all factors involved. There are four basic approaches to evaluation. A brief review of each may lead to a better understanding of their individual possibilities.

The ranking system, in its simplest form, consists of writing out each job and then placing it in its overall relationship to all other jobs with the lowest job on the bottom and the highest on the top. The ranking may be done by a group who knows and understands all jobs. Its weakness is that it does not reflect the degree of difference between one job and another and doesn't take into consideration the relative value of the different factors such as physical effort, skill, etc.

The grading method usually consists of setting up a number of predetermined wage and salary grades, then, through committee judgment, placing each individual job in the grade for which it is best suited. Here again, individual opin-

Block Ranking Analysis Sheet—Working Conditions

Health and Accident Hazards	PHYSICAL DISCOMFORT			
	None or Little	Some Discomfort	Above Average	Extreme Conditions of Heat, Dust, etc.
Very Little Accident or Health Hazard				
Minor—Cuts, Bruises, Abrasions, etc.				
Serious—Cuts, Bruises, Abrasions, etc.				
Severe—Broken Bones, Crushes, Eye Injuries, Demititis				
Maiming—Minor Members Fingers, Toes				
Maiming—Major Members				

Card-Fitzgerald-Leghorn 46

ion weighs heavily and the various job characteristics are not taken into consideration.

The point rating plans are a very real and definite step toward a scientific method of considering the individual characteristics of a job and weighing the importance of each characteristic. A rating committee usually examines each job by each individual characteristic. For example, the characteristic of skill may have a rating from zero to 200 points. Each job, when considered for skill, will be given a point value in relationship to the skill requirements with the top skilled jobs receiving 200 or nearly 200 points and the laboring type of jobs receiving zero to ten points. After a job has been considered for each factor in a like manner, the points are added and the total point evaluation reflects the value of that job to other jobs.

The factor comparison method is one of the more recent developments in job evaluation and combines two steps. First, all jobs are ranked separately under each factor as skill, responsibility, etc. After the jobs are ranked under each factor, the committee determines the money value that will be paid for each factor scaled down from the highest job to the lowest job.

Several years ago the Industrial Management Society of Chicago developed an entirely new and unique method of evaluation that in many applications has proven superior to those methods used in the past. This method combined the advantage of factor comparison and point rating. This plan has had tremendous advantages wherever there has been any union participation in the installation or subsequent examination of the job evaluation plan. Its particular advantage over the point rating system is that the point value of the job is determined not by an arbitrary assignment of points for each factor, but rather by an impartial ranking of the jobs in their importance to the factor. The advantage over the ranking system is that the final ranking pegs the value of the job to a predetermined and impartial valuation.

Easily Administered

While the above may seem somewhat complex, in reality this plan has been the easiest to understand and administer. This is very important. Many firms employ specialists to install their wage and salary administration plans. Unfortunately, only too often the plan installed is so complex and so difficult to administer that it is never fully understood by the company personnel, and consequently suffers from the lack of proper knowledge. Thus, a plan that can be easily understood and simply and consistently adminstered, has merits that deserve careful consideration.

The recommended method for evaluating jobs is to first develop an evaluation Committee composed of responsible members of management. Many plants have often included a representative from the approved employe bargaining agent for the employes in their evaluation committee. Such a procedure has very real advantages. First, it dispels any mystery that may be attached by the employes to the development of a wage and salary program, and second, through participation the union or employe representative places his tactic approval to the plan when completed.

A typical evaluation program in an organization that desired to evaluate all jobs in the company on a fair and equitable basis, may best illustrate the actual mechanics of evaluation. All jobs in the company were carefully analyzed and job descriptions prepared on the basis of the following job factors:

1. Physical requirements
2. Working conditions
3. Judgment and initiative
4. Contacts and supervision
5. Experience
6. Responsibility

The above factors are the observable characteristics which determine the relative requirements of any particular job. Based on the assumption that it is possible to determine the value of any given job more accurately by breaking down its component parts, each basic factor was subdivided into two major attributes. Once the method of analysis was established, every position was then studied and analyzed in the same manner.

The attributes which were considered under each factor follow:

1. Physical requirements
   a. Physical skill
   b. Physical effort and conditions
2. Working conditions
   a. Physical discomfort
   b. Health and accident hazards
3. Judgment and initiative
   a. Initiative and ingenuity
   b. Independent decisions required
4. Contacts and supervision
   a. Contacts
   b. Organization and direction
5. Experience
   a. Experience
   b. Education
6. Responsibility
   a. Financial
   b. Production

A block ranking analysis sheet (See Figure 1) was then constructed for each factor with the "a" attributes forming the orginate, and the "b" attributes forming the abcissa. The necessary degrees of each attribute were determined to reflect a complete range from least important to the most important conditions. With the block ranking sheets completed, a ranking committee was formed, and all jobs studied to determine the key jobs which would form the basis of the relative positioning of each individual job. In determining key jobs, every position was examined in the light of two considerations:

1. Both employer and employe consider present compensation fair and correct.

2. Present compensation was relative to similar occupations in similar companies in the surrounding area.

The blocks were then assigned values to fix the proper relationship for each attribute and factor, thus by careful preparation, study and impartial ranking, relative weights were established. The distribution of points over the various degrees of each factor was set on a formula of geometric progression.

The evaluation points applied to each job were totaled for each factor, and the resulting total evaluation points per job plotted in relation to the present rate of the job. The positioning of these points produced a curve of relationship between points and rates for all key jobs.

This curve of relationship was then converted into a chart of rate graduation fixing the minimum and maximum rates relative to the basic evaluation curve. After the establishment of the complete plan, every hourly and salaried job was evaluated. The total evaluation points were computed, and the correct relative rate was determined from the evaluation curve.

When the job rate is thus determined, it will be found that generally the majority of jobs are being fairly compensated. There will often be a number of high and low jobs being paid more than their true worth and other jobs not being paid enough in relation to their true worth. Practice has proven that the best approach to equalization, once the plan has been carefully tested, is to immediately adjust the low-paid jobs up to their true value. The high-paid jobs become a matter of individual consideration. It is not recommeded that any individual's rate be reduced as a result of the plan. Over a period of six months, those employes who are being paid more than their worth can usually be up-graded so they move into a higher pay classification or can be transferred to a job corresponding to their actual rate.

Seniority Problem

Often it will be found that old employes with high seniority feel that their years of loyalty to the company should be worth a higher rate than for a new man on the same job. When considering job requirements, years of service, other than the necessary experience required, have no weight or place in determining the job value. It may be worthwhile, however, to consider the installation of a length of service bonus in the form of a few cents per hour increase over the approved basic rate for so many years of service. Thus, the seniority problem does not become involved with the true determination of basic rates.

The trend toward job analysis and description and job evaluation has become strong in the past few years. Plans fairly conceived and executed have been given not only the approval but the encouragement of union and employe leadership. In fact, many of the progressive unions have gone to great lengths to school their members on methods and advantages of such wage and salary administration.

The coming years will be increasingly competitive. Company executives must have at their disposal every proven management tool to compete and keep abreast in the rapidly moving industrial picture. Sound wage and salary policies are the very basis of both their labor cost and industrial relations program. They certainly deserve full and considered judgment from top management.

(This is the fourth of five articles. The last will appear next week.)

Oklahoma May Allowable Set At 370,000 Barrels Daily

May allowable production for Oklahoma was set at 370,000 barrels of oil daily by the State Corporation Commission. This allowable was the same amount estimated as demand by the federal bureau of mines and represents a 3000 barrels daily increase of April allocation.

The state produced 359,141 barrels daily in March when the commission cut allowables some 30,000 barrels daily, and was under-produced by 384 barrels daily on the commission's order. For the week ended April 27, the state production was 367,150 barrels daily.

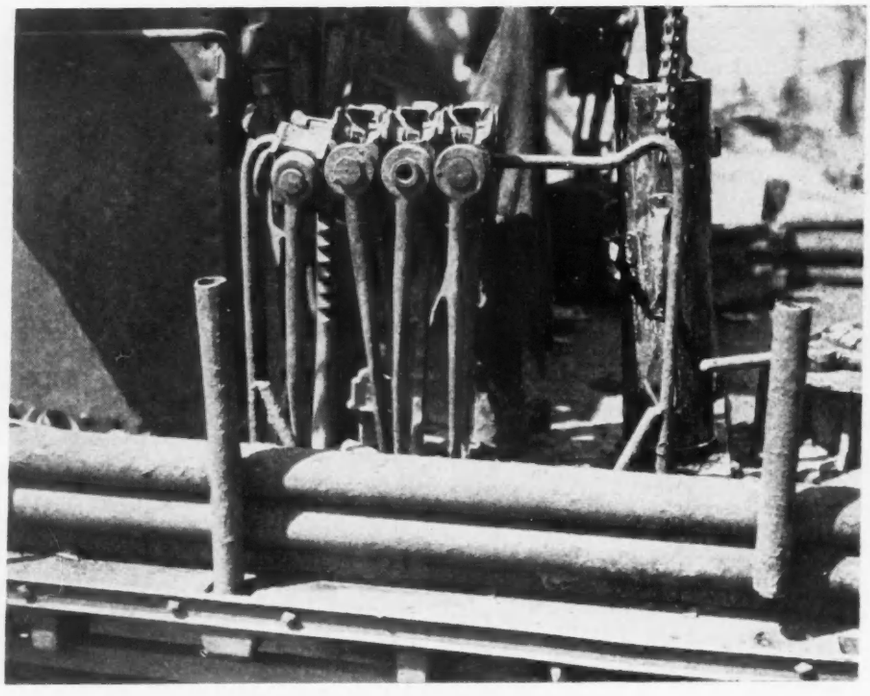
Special Rack Speeds Selection and Prevents Loss of Sucker Rod Elevators

Keeping tab on the many tools used on the average pulling unit service truck is a task which usually falls to the "other fellow" and as a consequence, many tools are lost or misplaced. In a move designed to cut down chances of losing sucker rod elevators, one well servicing company utilizes the handy rack shown which provides a place on which the elevators can be hung upon following completion of the job. Besides taking up negligible space on the truck bed, the elevators are latched in such a way that they cannot be removed unless they are rotated through 180 degrees and unlatched. The rack itself is a short piece of sucker rod bent to an inverted U-shape and secured to the truck bed. A sharp rise at each end of the horizontal bar prevents the elevators from slipping off the rack.

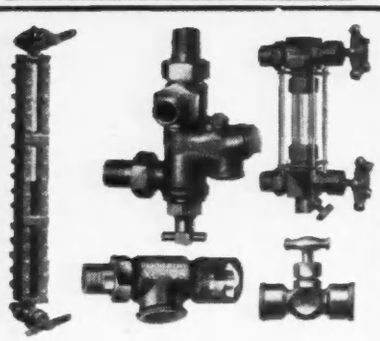
ELEVATOR CARE

Attaching the elevators to the rack requires no extra time, for they are simply dropped down over the bar and latched much as they would be latched on to a sucker rod. After it is latched the tool will swing down and hang in the inverted position shown in the photograph.

Pipe or other material racked outside the stored elevators prevents their swinging out and possibly causing injury to crew.



PENBERTHY
QUALITY PRODUCTS



Penberthy liquid level gages of various types—injectors—ejectors—all so widely used throughout the oil industry because they have always been dependable under the most severe service conditions.

All are of rugged construction and made by an organization with 57 years experience in the manufacture of quality products.

See Pages 2459 to 2455, Composite Catalog

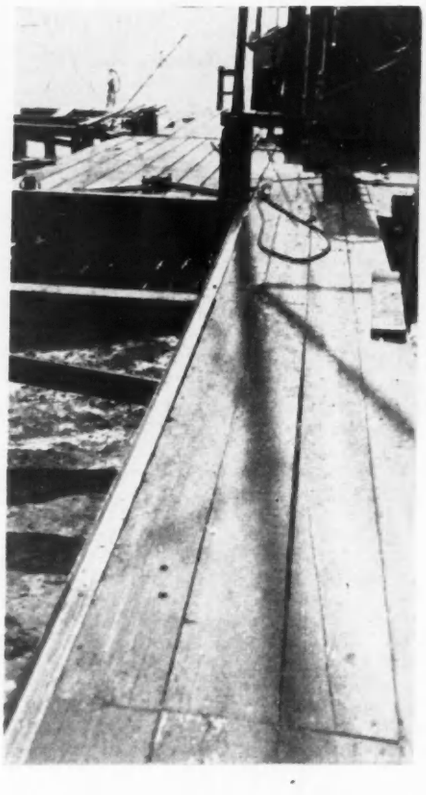
PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Walkway Trough Simplifies Tailing-In Operation

Helping to ease the work of short-handed crews on pulling jobs is the system devised by one superintendent for simplifying the "tailing-in" operations when rods or tubing are picked up from the rack. Along the outer edge of the walkway were spiked several lengths of 3 x 1-inch channel iron placed end to end to form a trough extending from the end of the walk to the edge of the derrick floor. Once the end of a length of tubing or rod is placed in the guide, it will stay there until lifted out at the end of its travel. The trough is easy to install, takes up negligible space on the rack and is inexpensive enough to permit leaving it at the well as a permanent installation.

RUNNING RODS

Besides serving as guide to the rods as they travel into the well, the steel protects the timber edge of the walkway against chafing or abration, and thus forestalls the formation of projecting splinters to cause possible injury to crew.



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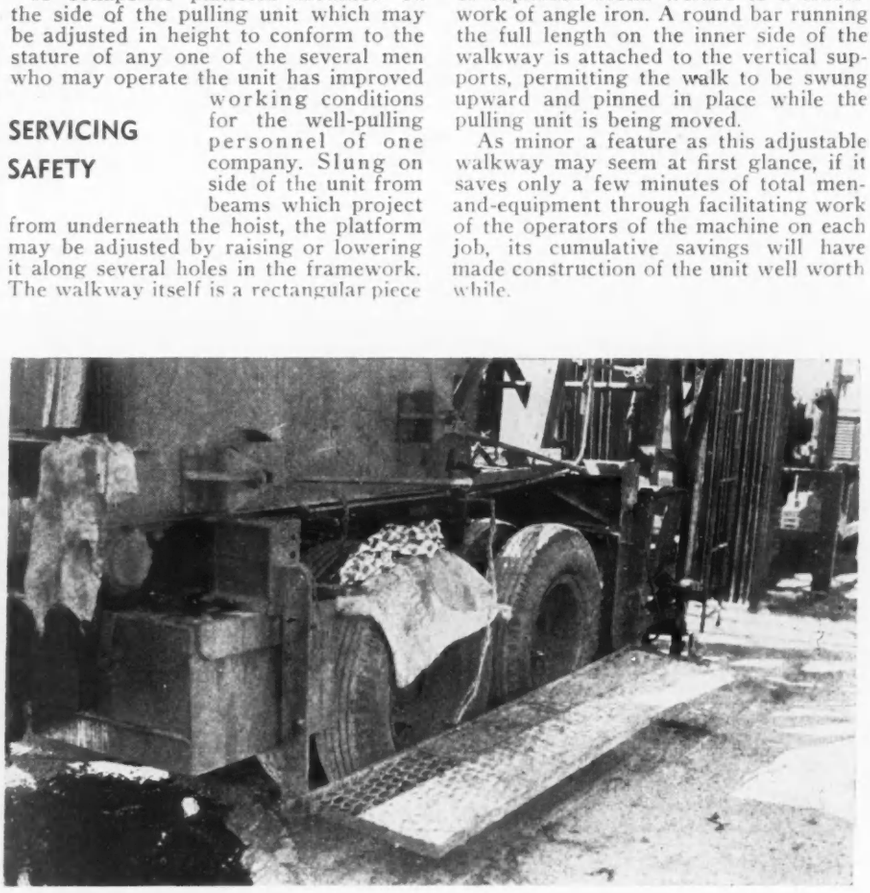
PRODUCTION HINTS

Collapsible Platform Adjustable to Operator's Height

SERVICING SAFETY

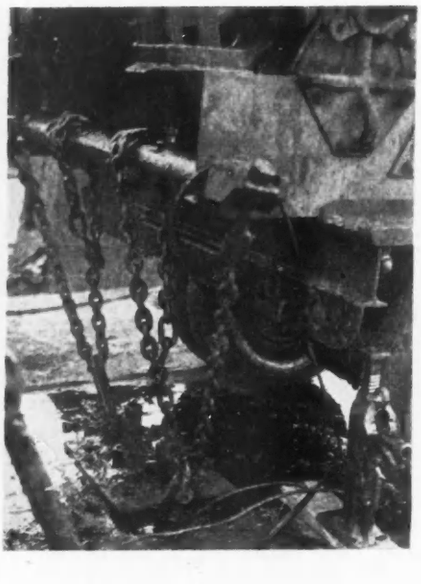
A collapsible platform mounted on the side of the pulling unit which may be adjusted in height to conform to the stature of any one of the several men who may operate the unit has improved working conditions for the well-pulling personnel of one company. Slung on side of the unit from beams which project from underneath the hoist, the platform may be adjusted by raising or lowering it along several holes in the framework. The walkway itself is a rectangular piece of expanded metal welded to a framework of angle iron. A round bar running the full length on the inner side of the walkway is attached to the vertical supports, permitting the walk to be swung upward and pinned in place while the pulling unit is being moved.

As minor a feature as this adjustable walkway may seem at first glance, if it saves only a few minutes of total men-and-equipment through facilitating work of the operators of the machine on each job, its cumulative savings will have made construction of the unit well worth while.



Tie-Down Plate Provides Service Truck Anchorage

UNIT HITCH



A type of pulling unit tie-down anchor which permits rapid hook-up without necessity for precise spotting at the well may be made from a flat rectangular piece of heavy steel plate, the latter preferably at least ⅝- to ¾-inch thick. In cutting out the plate, two ears are allowed to remain, one on either side, these being bent upward slightly from the horizontal as shown. Holes are burned in these ears, as well as at other points in the center of the plate. Those in the center are cut out to match existing studs set in the concrete at each well. When the truck backs into the well enclosure, the plate is slipped over the studs and nuts then screwed down to hold the unit in place. Anchor chains are secured to the ears and looped over a horizontal pipe bar running the width of the unit below and slightly to the rear of the hoist drum.

The saving in time realized at each well through use of this anchoring device contributes considerable to the lowering of production costs.

AGA Meeting

■ CONTINUED FROM PAGE 32

it has been necessary for gas distributing companies to develop their own apparatus and technique for applying coatings.

Mechanical cleaners are used to remove a light red rust which covers the pipe upon its arrival. The cleaners leave a clean, smooth surface over which is immediately applied at the proper temperature a thin bituminous primer. It has been found most economical and advantageous to clean, prime and then enamel all pipe in a central yard by the dipping process. On account of the pipe having to be handled, stored and hauled to the job, a hard semi-pliable enamel coating impervious to moisture is used for the purpose.

After priming, the pipe is dipped in a trough containing hot enamel, the temperature of which is thermostatically controlled. For handling the pipe a special cup with a handle is fitted over the ends of each joint. This cup serves to keep the enamel from entering the inside of the pipe and also provides a bare section at the end of each joint to allow for welding. These bare sections are treated on the job. For coating ells, expansion sleeves, couplings, etc., special plans have been developed.

Results Obtained from Five Years of Cathodic Protection on 24-Inch Gas Line Rapidly Deteriorating from Bacterial Corrosion

By Wm. E. Huddleston, consulting engineer, Bartlesville, Okla.

The first external corrosion leaks developed on a short section of a 24-inch welded gas transmission line approximately 10 years after it was placed in service in 1930. The leak frequency reached a maximum during the eleventh year of service. The usual tests for galvanic corrosion, cathodic interference, and electrolysis failed to account for such an enormous amount of pitting. It was observed that the pits were filled with a dark brown substance that was subsequently identified as being iron sulfide.

It was decided to install rectifying equipment in an attempt to reduce the leak frequency. Accordingly, a 35-ampere cathodic rectifier was installed, and pipe-to-soil potentials in excess of 1-volt were immediately established.

At the time pit hole leaks were developing at scattered locations at the rate of a leak every 10 to 15 days. A total of only six pit hole leaks developed during the 26 months following installation of the rectifier. No pit hole leaks have occurred during the past three years.

These results lead to the conclusion that excellent results can be obtained in combating microbiological corrosion by the use of cathodic protection.

Magnesium Anodes for the Cathodic Protection of Underground Structures

By H. A. Robinson, Dow Chemical Company, Midland, Michigan.

In view of the electrochemical properties of magnesium, a program of research and development work was begun some six years ago to determine how magnesium would perform as a sacrificial anode. As the work progressed it became apparent that the galvanic anode of magnesium or any other metal must satisfy certain other requirements in order to reach maximum effectiveness as a means of applying cathodic protection. This lead to a research and development program of progressively increasing scope.

The field and laboratory studies have led to the following conclusions:

1. For current densities in excess of about 40 milliamperes per square foot, laboratory data indicate that electrical recoveries of 500 to 600 ampere hours per pound, together with good distribution of corrosion attack and freedom from polarization effects, may be expected from magnesium anodes operating in a favorable chemical environment.

2. Anode performance in the field shows a progressive trend toward the laboratory level of performance as laboratory investigation is incorporated into field practice. While certain of the field tests show anode performance approaching that observed in the laboratory, in general, the field data currently available do not cover a sufficient number of tests, nor are the tests of sufficient duration to permit specific conclusions.

Neutralizing Circuit for Elimination of Long Line Current Corrosion

By Wm. R. Schneider, Pacific Gas and Electric Company, Emeryville, Calif.

Electric protection can be applied to cables and pipes that are being corroded by long line or stray currents, without the use of the ground anode of the conventional cathodic protection system. A direct current from an outside source, sent through the pipe or cable sheath, will cause a drop-of-potential that will neutralize the galvanic soil currents causing corrosion. The circuit is useful in giving electric protection to lines laid in high resistance soil, where cathodic protection would require either a very large anode or an excessive power consumption.

Additional protection can be given to the pipe by adding a small ground electrode carrying a correspondingly small current. This will eliminate self corrosion, and give protection to the lines extending beyond the immediate vicinity of the corrosion eliminator, or electric protection station.

Secondary electrolysis or cathodic protection interference, on other underground structures, can be avoided by the adoption of the neutralizing circuit in place of the usual type of cathodic protection having a grounded anode.

The cost of the additional copper conductor required to span the pipe line to be protected is usually less than the saving on the ground electrode. Power losses and power costs, particularly in high resistance soil areas are lower than with straight cathodic protection.

Down the Hole Treatment of Condensate Wells

By T. S. BACON, Lone Star Producing Company, Dallas

Field experiments on the chemical treatment of distillate wells to reduce rate of corrosive attack have been conducted in the Opelika, Texas, field since December, 1942.

Both the ordinary liquid pump and the lubricator type of injector have been used. The lubricator is preferred for injecting small daily volumes of treating solutions. Lubricators with large capacities become extremely bulky and expensive, and for this reason pumps are preferred where requirements range between 50 and 150 gallons per day per well. Pumps of the smaller capacities have been driven by expansion of gas. Larger pumps have been engine driven. Pump valves and packing have given trouble when handling dilute aqueous solutions, but this becomes relatively insignificant when oil-soluble inhibitors are used in a solution of mineral seal oil.

Experience shows that the use of alkalies in the Opelika field will result in deposition of calcium carbonate scale at such a rapid rate as to seriously restrict the flow of gas after 30 days. Use of complex polyhosphates failed to indicate any material reduction in the rate of scale formation. While alkalies apparently reduce the rate of well-head equipment corrosion, the necessity for frequent reacidization of the well tubing to remove the carbonate scale causes corrosion.

Sodium silicate solution was found to form very heavy deposits of silica at the point of injection. Extreme difficulty was experienced in injecting an organic sulphur compound due to the formation of a heavy sludge that plugged up the pump valves. Sodium nitrite was found to result in plugging the tubing string with what was probably calcium carbonate.

Difficulty was experienced in obtaining returns of chromate ion at the wellhead. Tubing strings pulled from wells treated with sodium dichromate have shown heavy deposits of reduced chromium compounds both inside and outside the string. Preliminary results on the use of naphthenic acid in oil solution are extremely encouraging. It is planned to expand this treatment materially.

The development of well-head metal test coupons has been extremely helpful in evaluating various inhibitors. These test coupons are small strips of metal which are inserted in the flow line through a bushing or flange. The effectiveness of the inhibitor in tubing corrosion can be determined by the use of tubing caliper surveys. These testing methods should give an increasing amount of reliable information.

Control of Condensate Well Corrosion

By POUL L. MENAUL, Stanolind Oil & Gas Company, Tulsa

The damage shown by corrosion of the inner surfaces of tubing, chokes and flow lines of condensate or gas distillate wells indicates the potential danger of failure of such equipment.

When a well is to be treated chemically, a chemical analysis of the water produced is made first so that the chemical to be injected can be chosen which will have no deleterious effects, such as forming scale.

When production is through the tubing, the chemical is injected into the casing annulus with the casing pressure balanced. Mechanical lubricators were used first to inject the chemical but the brass fittings and packing in these injectors continued to give trouble so the use of a specially designed gravity type of injection was commenced. The feed into the casing is by gravity and a ¼-inch needle valve is used to control the rate of flow.

Results of field trials on four wells using the gravity injector indicate that chemical treatment has effectively eliminated corrosion. The iron content of the water produced by one well has been decreased from about 280 ppm to less than 3 p.p.m. In other wells, the iron content has been decreased to less than 10 ppm.

Crude Runs to Stills and Refineries' Output Lag; Production Registers Gains

Crude runs to stills and refineries' output of principal petroleum products lagged during the week ended May 4, while crude production increased moderately.

Drafts totaling slightly over 1 million barrels were made on gasoline stocks, while additions of almost 2 million barrels were made to the combined stocks of light and heavy burning oils. These trends were reported by The American Petroleum Institute in its latest weekly bulletin.

Crude was produced at the daily rate of 4,721,000 barrels in the United States during the week, an increase of 49,000 barrels a day over last week's output, and 108,000 daily less than was produced during the comparable week of 1945. This production figure is a revision which has excluded condensate production in Texas and New Mexico.

Crude runs to U. S. refinery stills averaged 4,672,000 barrels daily, a drop of 13,000 barrels per day from the previous week and 149,000 barrels, or 3.1 percent, from the corresponding period of last year.

Stocks of refinable crude were reported by the U. S. Bureau of Mines to be 224,443,000 barrels on April 27, representing an increase of 2,754,000 barrels during the preceding seven days, and 969,000 barrels more than was on hand April 28 of last year.

Gasoline production, including natural gasoline blended at refineries, totaled 13,889,000 barrels for the week, which was a decrease of 339,000 barrels from last week's output, and 1,171,000 barrels less than the output of the comparable period a year ago. Stocks of finished and unfinished gasoline were reduced by 1,083,000 barrels during the week, bringing them down to 98,548,000 barrels, which is 9,097,000 barrels, or 10.2 percent, more than the 89,451,000 barrels held a year ago.

Distillate fuel oil production, off 255,000 barrels from the prevous week, amounted to 5,313,000 barrels for the past seven days. The week's distillate output exceeded that of last year's week by 517,000 barrels, or 10.8 percent. Distillate fuel stocks were increased by 1,021,000 barrels during the past week and now stand at 31,487,000 barrels, 2,096,000 barrels more than was on hand at the same time last year.

Residual fuel oil output totaled 9,010,000 barrels, a drop of 194,000 barrels from last week, but 24,000 more than was produced during the same period of 1945.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1943	4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	4,762	9-30	4,798	12-30	240,992	1- 1	89,162	4- 1	48,162	10-28	64,744	10- 7
1945	[1]4,944	7-14	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	4,726	3- 2	4,789	4-20	229,430	3- 2	105,233	2-16	35,199	1- 5	42,371	1- 5
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 3
1941	3,364	1-11	[3]3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-13
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-18	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	220,258	9- 9	76,302	1- 1	30,232	4-19	49,737	3-18
1945	3,621	10- 6	3,409	10- 6	[4]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	98,494	1- 5	25,131	3- 9	37,289	4- 6

TRENDS OF 1945 AND 1946

Trends in Week Ended	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1945:									
January 27	4,727	4,756	221,310	14,957	88,223	4,843	33,561	9,252	51,119
February	4,777	4,803	219,351	15,500	95,972	4,958	28,753	9,084	46,713
March 31	4,781	4,677	223,782	14,644	98,758	4,548	26,889	9,184	41,745
April 28	4,805	4,780	223,474	14,633	94,068	4,636	28,273	9,379	39,813
May 26	4,887	4,950	222,831	15,194	89,121	4,667	29,184	9,670	38,548
June 30	4,903	4,999	220,781	15,546	86,472	4,910	32,213	9,077	40,488
July 28	4,930	4,996	218,507	16,106	86,008	4,598	36,071	9,586	42,283
August 25	4,982	4,931	[4]211,813	15,986	84,693	4,960	39,782	9,356	46,201
September 29	4,357	3,812	222,387	11,913	79,552	3,940	43,689	7,047	46,853
October 27	4,273	4,838	224,230	15,530	74,335	5,159	43,472	8,691	45,943
November 24	4,469	4,648	219,363	15,681	83,184	4,802	45,258	8,800	47,474
December 29	4,474	4,729	218,918	14,546	95,205	5,055	36,651	8,765	42,447
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,293	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,357	28,240	8,738	37,746
April 6	4,446	4,523	221,214	13,718	104,226	5,060	29,253	8,401	37,289
April 13	4,691	4,636	221,260	13,351	102,581	5,265	30,047	8,608	37,862
April 20	4,686	4,789	221,689	14,029	101,159	5,211	30,284	9,230	38,124
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 4, 1946	4,721	4,672	.....	13,889	98,548	5,313	31,487	9,010	40,212
May 5, 1945	4,829	4,821	[5]223,474	15,060	89,451	4,796	29,391	8,986	39,661
Change:									
In week	+49	—13	+2,754	—339	—1,083	—255	+1,021	—194	+808
In year	—108	—149	+969	—1,171	+9,097	+517	+2,096	+24	+551
In year	—2.2%	—3.1%	+0.4%	—7.8%	+10.2%	+10.8%	+7.1%	+0.3%	+1.4%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922 due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, April 28, 1945.

Union Oil Official Suggests Five-Point Expansion Program

R. G. Greene, Union Oil Company, discussed "An American Design for Foreign Petroleum Expansion" before the Pacific Section, American Association of Petroleum Geologists, at Los Angeles, April 30.

Greene traced the history of foreign exploration for oil by United States companies since 1876 and suggested a design for future foreign expansion based on the experience of the past.

In considering the costs of foreign exploration, he said that from 1919 to the present, American companies have spent approximately $1,280,000,000 for foreign exploration and development. As returns on this investment have already begun, it appears that the American foreign reserve of about 11½ billion barrels has cost about 7 cents per barrel.

This figure does not include transportation, refining and marketing, however. If these items are included, the total reaches about $3,200,000,000. Greene suggested a five-point design for future foreign expansion, as follows:

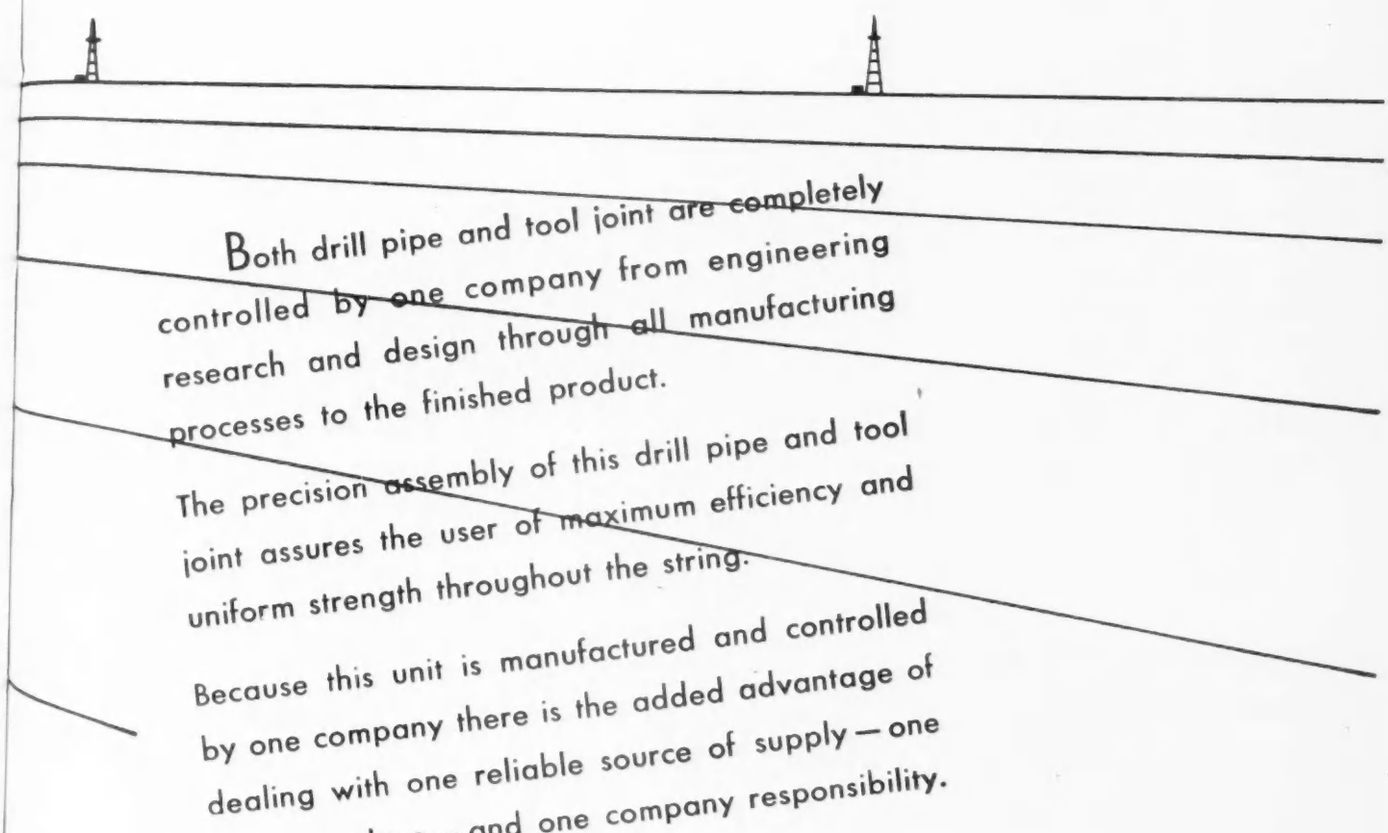
A greater number of young professional men must move abroad, and all oil men should enlarge their perspective to include many problems which follow foreign development.

More of the smaller independent American companies should pool their resources for foreign undertakings.

U. S. companies should explore the possibility of joint company and sovereign nation operations.

We should eliminate all thought of marketing combines and cartels.

The State Department should develop long-range plans to render every assistance within its power to American companies desiring to do business abroad.



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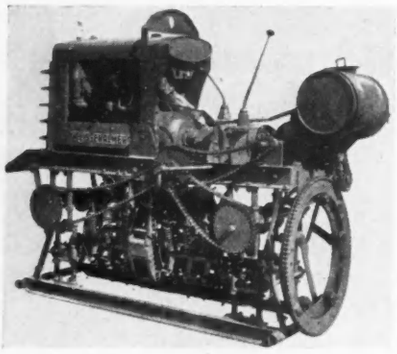

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Humble Sells Carthage Gas; Projects Gathering System

Humble Oil & Refining Company has contracted to sell the allowable production of its 14 gassers and projected wells in the Carthage field, Panola County sector of East Texas, to the Chicago Corporation for five years. The contract price is reported to be 4 cents per 1000 feet, and 50 percent of the revenue derived from the hydrocarbons obtained from the gas by the Chicago Corporations natural gasoline plant. Humble will install a gas gathering system and deliver to the plant. The gassers have been shut in since completion for lack of a market.

Atlantic Purchases Pipe for 46-Mile West Texas Trunk Line

The Atlantic Pipe Line Company has purchased pipe to construct 46.4 miles of eight-inch trunk line to extend from the Block 31 field, Crane County, to its West Texas tank farm and pipe line terminal near Midland. Pipe for this line is due to start arriving in August, providing the coal strike is terminated shortly.

The company is erecting two 80,000-barrel steel tanks at its proposed Block 31 field station site in SE¼ Sect. 39, Block 31, to segregate the high-gravity oil produced from the Devonian and Ellenburger zones. Both grades of oil have an abnormally low sulphur content. Atlantic will acquire the field gathering system installed by The Texas-New Mexico Pipe Line Company, which currently handles the oil produced by the field's two dual completions and a Devonian well, when its extension to Midland is completed. This system will then be enlarged into two separate lines, which will operate largely by gravity, in serving the Devonian and Ellenburger producers. Atlantic discovered the Block 31, and is the only producer while it has 16 additional active tests. The Block 31-Midland line will utilize an abandoned pipe line right-of-way that will afford considerable saving in traversing surface rock.

Humble Line in Operation

Humble Oil & Refining Company's new ten-mile, 4 and 6-inch natural gas line running east from the North Crowley field, South Louisiana, to tie into the company's recently constructed 14-inch gas carried from the Pecan Island field to Opelousas, La., has been completed and placed into operation. Latex Construction Company, Houston firm, was the contractor.

$50 Million Building Program Planned by Cities Service

W. Alton Jones, president of Cities Service Oil Company, has announced a $50 million construction program will begin when manpower and materials are available.

Expenditures will be divided as follows: Cities Service of Delaware, construction in the Chicago area, $18 million; Cities Service Gas Company, construction of a 26-inch natural gas line from the Guymon-Hugoton field to Kansas City, $25 million. The remaining $7 million will be spent in improvements of service stations and other facilities of the company.

United Gas Company Carthage Plant to Go Into Operation

The final link in United Gas Pipe Line Company's East Texas development project will go into operation this month, company officials have announced. The latest addition is the absorption gasoline plant at Carthage which is designed to process 150 million cubic feet of gas daily.

Average daily recovery of the plant has been estimated at 150,000 gallons of products.

A gathering system of more than 100 miles of lines will connect the plant with 81 wells in the Carthage field.

Texas Empire Orders Storage Tanks for Midwestern Carrier

The Texas Empire Pipe Line Company has placed order for 19 crude storage tanks, aggregating 1,072,000 barrels capacity, for installation on its Middlewestern trunk line between the Cushing district, Oklahoma, and Chicago. The additional tankage will consist of eleven 80,000 barrels and eight 24,000 barrels capacity tanks.

Texas Line Completed

Latex Construction Company, Houston firm, has completed the Katy Operators Committee's new 50-mile, six-inch products line from the Katy field, Harris and Waller counties, Upper Texas Coast, to a terminal on the Houston ship channel.

Elk Hills Reserve Production Is Cut to 8450 Barrels Daily

Production from the Elk Hills Naval Petroleum Reserves has been cut from 15,000 barrels daily to a rate not in excess of 8450 barrels daily effective May 9. This is the second cut-back in production since V-J Day. The first was from 65,000 barrels daily to 15,000 barrels daily on August 23, 1945. The new cut was ordered by Secretary of the Navy Forrestal.

The rate of 8450 barrels daily was determined to be essential to carry on the various testing and readiness projects which have been in progress in the field for the last six months. These projects are being carried on to test the effects of (a) natural water drive, (b) pressure restoration by gas injection, and (c) gravity drainage. The results of these experiments probably will influence the policy of maintaining and producing the Elk Hills field in the future.

Meanwhile, the exploratory program of both the Shallow and Stevens oil zones is progressing. There are five drilling strings exploring the Stevens zone, at depths from 5000 feet to 9000 feet, and one string exploring the Shallow zone at about 3000 feet.

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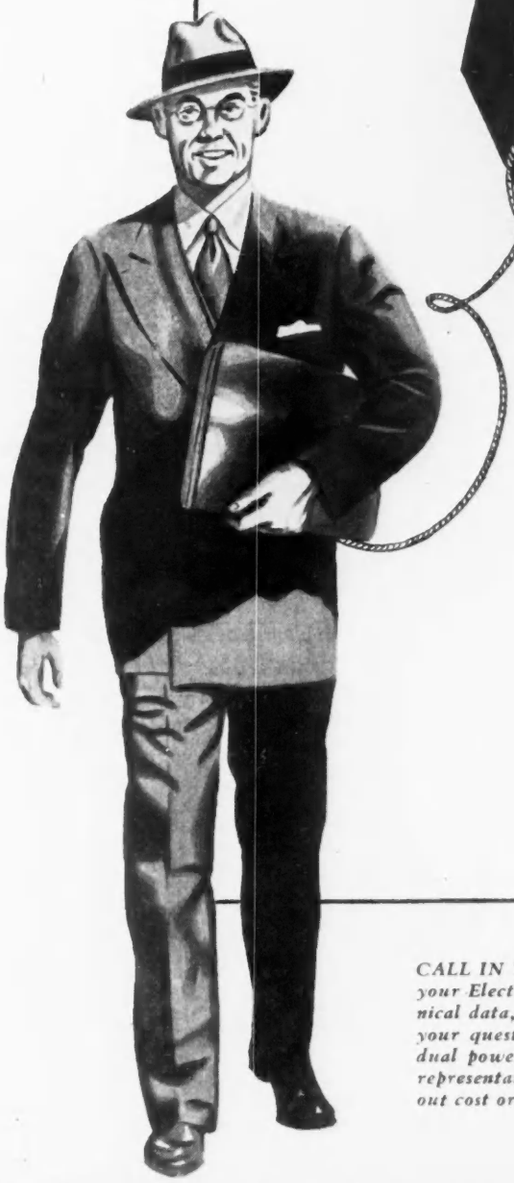

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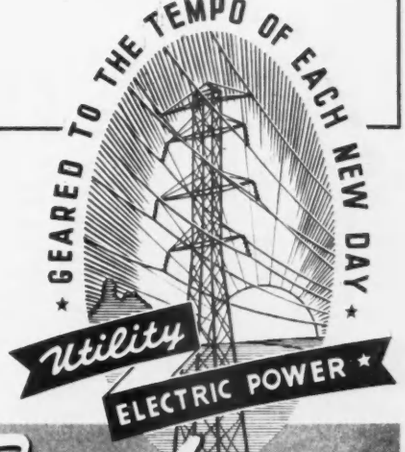

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Japs' Ingenious Production Methods Revealed by Naval Technical Mission

Japan may become the scientific equal of prewar Germany in 20 years.

This prediction has been made by Comm. George L. Neely, recently returned from military service to his former position as lubricant division manager of Standard Oil Company of California's marketing department.

Comm. G. L. Neely

At the end of the war, following service with the Navy as a "trouble shooter" on engineering problems in the Pacific, Neely was assigned to head the petroleum division of the U. S. Naval Technical Mission in Japan. It was his job to study the technical development and petroleum position of Japan at the time of surrender and he reported he found "amazing" facts regarding the country's petroleum research activities and ingenious production methods.

The survey, Neely reported, disclosed the Japanese people to be very capable, highly intelligent, and possessed of marked creative ability and ingenuity in scientific work, particularly in petroleum research. He believes that Japan, while not yet "of age" technically, is rapidly closing the gap between what its scientists know and what those of other countries know. He attributes the reason for this rapid technical development primarily to the Japanese appreciation of the value of research.

As an example of their strides in petroleum research, Neely cited the fact that by the end of the war, the Japanese Navy had developed and was operating in the town of Ofuna, 20 miles south of Tokyo, the world's largest petroleum research plant. This project, costing $35 million, included 78 laboratory buildings and employed 3200 workers. Experiments at this and other plants in Japan developed for use as petroleum substitutes, such materials as pine tree roots, pine needles, rubber, barks of certain trees, and even orange peelings, sweet potatoes and soya beans. The extraction of oil from pine roots, although highly expensive, became the country's principal substitute source of aviation gasoline at the end of the war, yielding 2½ million barrels of oil and, in turn, 400,000 barrels of 94 octane gasoline per year. However, at this production rate, the pine trees of Japan would have been exhausted by the end of 1946, it was estimated.

In reviewing Japan's wartime petroleum program, Neely explained that in the early 1930's Japan began planning a petroleum supply for the coming war with the United States. A plan was developed to put into underground storage some 60 million barrels of petroleum products to be tapped only when the supply from the U. S. was cut off. This backlog was expected to hold out until development of East Indies sources, anticipated by the middle of 1943. It was found that everything was executed on schedule and oil shipments from Borneo and Sumatra began as planned. The one flaw in the program was the failure to counter the Allied submarine forces. Tanker sinkings by submarine gradually broke down the well-constructed plan and by the end of 1944 only one refinery was operating on imports. Desperate now, the Japanese converted aircraft carriers and even one of their big battleships into tankers, but these efforts still did not satisfy the need and it became necessary to look for substitutes. It was then that Japanese research extemporized with the pine root program.

Neely claims that today, although still having a long way to go to challenge the leading nations in technical knowledge, Japan has lost no time in requesting permission to proceed with peacetime research utilizing wartime equipment and is well along on its programming for rapid resumption of technological growth.

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Phillips Venezuelan's First Wildcat Unloads Oil and Gas

The first exploratory test well drilled in Venezuela by Phillips Venezuelan Oil Company, subsidiary of Phillips Petroleum Company, got out of control while being completed and is flowing at a daily rate of several hundred barrels of oil and an estimated 50 million cubic feet of gas, Phillips has announced.

Casing was cemented through an oil and gas zone of 600 feet thickness, with an estimated 375 feet of oil and gas-bearing sand. The well started unloading while the perforating gun was being removed after perforating the casing opposite a 20-foot section. Gas was found at 4581 feet and the first oil sand was encountered at 4706 feet.

The wildcat is on the company's 25,800 acre Mata Grande concession in the state of Monagas. Phillips Venezuelan holds concessions on about 875,000 acres in Venezuela.

Bolivian Production

Bolivia's crude production in December, 1945, amounted to 32,365 barrels, compared with 32,311 barrels in November, according to the *Foreign Commerce Weekly*. December output was divided as follows: Camiri, 12,266 barrels; Bermejo, 11,509 barrels; and Sanandita, 8590 barrels.

☆ California

Yolo County's Dunnigan Hills Gas Field Gets Extension

Extension of Dunnigan Hills gas field in Yolo County confirmed; Barnsdall and Wilshire to drill wildcats in Devils Den area; Santiago well good for 1300 barrels; test for schist production fails in Ant Hill field; Superior to prospect for gas in Tehama County.

Yolo County: Natural Gas Corporation has completed DuBois 1 in 28-11n-1w, an exploratory natural gas well in the Dunnigan Hills field, north of Sacramento and about a mile southwest of The Texas Company discovery. In a test at 2600 feet the well flowed 1,227,000 cubic feet through ¼-inch choke. Natural Gas may drill more wells in the field, but no other location has been selected. The concern has other gas wells in the Rio Vista field. It is a wholly owned subsidiary of Pacific Public Service Company. Forty-eight percent of the stock of the latter company is owned by Standard Oil Company of California.

Kern County: Barnsdall Oil Company located a prospect hole, Bates 1, east of the Devils Den field in 20-25s-19e. Site is approximately 1 well location northeast of C.C.M.O.'s Bates 2, deep test abandoned in July at 9181 feet, with a light showing of oil between 8043-47 feet.

Northwest of the Devils Den field in the Deganey Gap area, Wilshire Oil Company will drill Kalloch 1 on a government permit in 11-25-18.

Independent Exploration Company has taken a lease on part of the Mazzie Farms in 24-32-29, Tejon area, and will drill a test to basement. Southward in Sect. 36, L. S. Gilmour has staked a wildcat, Tejon 1.

Attempts to develop new production in the Temblor area are continuing with Richfield Oil Corporation spudding M. & L. Fee 2 in 18-29s-21e, and Standard moving in equipment to drill Anderson 37-17W, a Carneros zone test in Sect. 17.

Richfield brought in a good well in the Santiago sector of the Midway-Sunset field. The company's Leutholtz A-7, 22-11n-23w, was completed flowing 1300 barrels of 20-gravity oil through ½-inch choke.

Texas has taken over Richfield's Mott 1 at Mountain View in 9-31-29 and is pulling liner to deepen. Present depth is 6145 feet.

Amerada Petroleum Corporation's test for schist production in the Ant Hills field, S. P. 76-15, in 15-29s-29e, has been abandoned. Recovery was fresh water on a formation test.

Kings County: Drill pipe was stuck 6 feet off bottom in Standard's Kettleman Hills Middle Dome wildcat, 73-30V in 30-23-19. Crew is circulating oil to loosen. Total depth is 10,797 feet.

Tehama County: The Superior Oil Company will drill a prospect well for natural gas in the Corning area. Company has located Russell 1 in 12-24n-3w.

Orange County: Hiawatha Exploration Company has uncovered a small producing area between the old Huntington Beach field and the West Newport Beach field in 13-6s-11w. Atha 2 was completed flowing 1250 barrels of 22.6-gravity oil. Several dry holes have been drilled in the area, which indicates a small accumulation.

Los Angeles County: The Ohio Oil Company's Gardena Community Four 1 in 23-3s-14w, is sidetracking at 9960, still bothered with the old fish. In the East Los Angeles area, Chanslor-Canfield Midway Oil Company is still trying to shut off water in Bandini 1 in 21-2s-12w.

Washington

Standard Oil Company of California's Whatcom County Wildcat, Ferndale Community 11-61-5, is drilling below 6050 feet.

Oregon

The Texas Company's Cooper Mountain 1 is drilling below 9100 feet. Richfield Oil Corporation's Barber 1, near Portland, is drilling below 6130 feet.

Drilling Contractors Meet

The sixth annual meeting of the American Association of Oilwell Drilling Contractors will be held in San Antonio, at the Plaza Hotel, October 1-2.

☆ Oklahoma

New Wilcox Sand Pool Likely For Pottawatomie County

New Wilcox sand pool likely for Pottawatomie County; north limit of South Moore pool defined; 9⅝-inch pipe set to 8360 feet in Dewey County wildcat; Carter builds tankage for McClain County pool opener; Pawnee County wildcat logs saturation in Bartlesville sand; gasser discovered at 425 feet in Rogers County wildcat.

Pottawatomie County: A Wilcox sand pool 3½ miles west of Macomb, in western Pottawatomie County, was indicated as J. F. Smith and associates logged good saturation and odor at Klingensmith 1, SW SW SE 23-8n-2e. A core from 5636 to 5639 feet recovered 1½ feet of dolomite with oil staining and strong odor and 6 inches of soft sand with good saturation and odor. Electrical log indicated the top of the sand at 5632 feet and a drill-stem test from 5632-5639 feet, total depth, recovered 2280 feet of 41-gravity oil and no water. Operators are running casing to make tests.

Cleveland County: The north limit of the South Moore field of northwestern

Wells Completed in the United States in Week Ended May 11, 1946

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second or third issue of each month. More detailed data on wildcats published in third or fourth issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Alabama													6	7
Arizona													1	
Arkansas	1				1						1	5	62	52
California	25			2	27				3	3	30	33	658	732
Colorado	1				1						1	6	41	11
Florida												1	7	5
Georgia													1	3
Illinois	26			18	44	2	2		19	21	67	37	721	582
Indiana	6	3		2	11	1			1	1	13	7	126	100
Iowa														1
Kansas	20	1		7	28	2			9	9	39	36	715	537
Kentucky	4			3	7						7	14	184	160
Louisiana	22	2	1	6	31		2		3	5	36	29	450	348
North Louisiana	10	1		2	13		1		2	3	16	13	229	108
South Louisiana	12	1	1	4	18		1		1	2	20	16	221	240
Michigan	5	1		4	10				2	2	12	10	241	265
Mississippi	1				1	1					2	4	79	134
Missouri												2	7	15
Montana	1				1						1	2	80	68
Nebraska														2
New Mexico	6				6				1	1	7	6	137	172
New York	15		10		25						25	25	382	350
Ohio	7	3		1	11						11	10	324	282
Oklahoma	29	2	6	6	43		1		2	3	46	33	895	819
Pennsylvania	27	3	15	2	47						47	45	1,001	1,027
Tennessee													2	1
Texas	87	13	1	30	131	3	7	1	29	37	171	153	2,878	2,586
E.Tex.Bkr. Co.'s	2	3			5		2			2	7	2	59	29
Rest of E. Texas	9			1	10		1		1	2	12	11	196	72
North Texas	25		1	13	39				10	10	49	52	823	571
W. Central Tex.	5			4	9				3	3	12	13	216	167
West Texas	21			2	23	3	1		3	4	30	29	594	681
Tex. Panhandle	2	5		2	9						9	5	158	223
G. Coast, Upper	3	3		4	10		2		4	6	16	9	258	258
G. Coast, Lower	18	2		2	22		1		3	4	26	22	381	370
Southwest Texas	2			1	3			1	2	3	6	6	142	185
S. Central Tex.				1	1				3	3	4	4	51	30
West Virginia		8			8	2					10	15	259	270
Wyoming	1			1	2						2	6	51	58
Total U. S.	284	36	33	82	435	11	12	1	69	82	528	479	9,308	8,587

* Includes distillate wells. † Includes salt water disposal wells.

Cleveland County has been defined by Phillips Petroleum Company's deep test, the Louvena 1, C N½ SW NE 27-10n-3w. With a total depth of 8217 feet, the well was plugged back to test the Bartlesville-Burgess zone topped at 7813 feet and the Hunton lime topped at 8112 feet, with no show in either zone. The well, now abandoned, is offset on both the east and west by stripper wells.

Dewey County: Oklahoma Natural Gas Company has set 9⅝-inch casing at the Oakwood Unit 1, NW NW NW 6-17n-14w, wildcat near Oakwood. The casing was set to 8360 feet to protect a good show of oil and gas in the lower Tonkawa sands. The wildcat is drilling to the proposed depth of 9500 feet to test the Wilcox sand.

McClain County: The Carter Oil Company is erecting tankage at Thompson 1, NE SE 36-8n-4w, latest of its McClain County discoveries. The well tested 72 barrels of oil in 2 hours from the Chimney Hill section of the Hunton lime with perforations from 9970-10,003 feet. An estimated 150 barrels a day were tested from the Viola lime at 10,-120-340 feet. Operators have not announced from which zone they will complete.

Pawnee County: J. A. Turner and Glenn Gillespie's wildcat 3 miles south of Pawnee townsite indicated it might open a new pool when 68 feet of stained pay in the Prue sand from 3114 to 3214 feet and Bartlesville sand from 3346 to 3400 feet was found on the electrical log. The wildcat, Summers 1, is in SW SW SW 34-21n-5e.

Rogers County: Recovering 5 million cubic feet of gas and a spray of oil during test of a sand at 425-435 feet, Charles P. Quinlan's Martin 1, SE SE SE 25-19n-16e, 4½ miles southwest of Inola in southern Rogers County, has touched off an intensive drilling campaign in the area. The wildcat was wide open before a control head could be attached to the 8-inch pipe. It averaged 25 to 30 barrels of oil a day with 5 million cubic feet of gas. Operators plan to drill to 900 feet where the Wilcox sand is expected.

☆ Kansas

State's Ninth Pool Opener Of Year Is Given Potential

State's ninth pool opener of year given potential; Marjorie pool gets duster; gas runs for Cunningham field limited by corporation commission; Bridgeport Oil drilling offset to Stoops discovery; Stafford County wildcat drilling deeper.

Stafford Conuty: Kansas' ninth pool opener since January 1 was given a permanent pump potential rating of 480 barrels of oil daily during recent tests. The discovery well, Alkay Oil Company's Gray 1, SW NE NE 11-24s-13w, 2 miles northeast of the St. John pool, plugged back from a total depth of 3882 feet to find production in the Lansing-Kansas City lime, topped at 3520 feet. In process of completion the well received 1000 gallons of acid.

Barber County: Phillips Petroleum Company has a dry hole at Marjorie 2, C NW NW 1-31s-14w, Skinner pool. The Maquoketa was topped at 4400 feet and the Viola lime at 4422 feet. The Maquoketa was tested through perforations but operators got more water than oil.

Kingman County: Total gas runs for the Cunningham field of Kingman and Pratt counties was set at 217,098,000 cubic feet of gas for May by the state conservation division. This is 4,182,000 cubic feet above the April figure. Purchasers recorded a market demand of 282 million cubic feet but the commission limited the field's production to the maximum rate without waste. The gas-oil ratio for combination wells was set at 5500/1.

Pratt County: The Bridgeport Oil Company has topped the Kansas City lime at 3896 feet at the Reece "A" 1, NW SW SE 7-29s-12w, northeast offset to the Stoops 1, discovery well in the area. The Stoops 1 is producing from the Viola lime topped at 4446 feet. Operators are drilling Reece 1 to the Viola.

Stafford County: W. P. Faulkner's Fischer 1, NW NW NE 8-21s-13w, was being drilled deeper after acid treatment failed to increase a ½-barrel show of oil per hour at 3595 feet. After setting pipe on top of the Arbuckle at 3591 feet test was drilled to 3595 feet and a 500-gallon treatment of acid was given with no increase in oil and operator is now drilling below 3607 feet. The wildcat is 1½ miles west of the Shaefer pol and the same distance south of the Hiss pool, Barton County.

API Session Set

War-born improvements in drilling and secondary recovery methods will be the theme of the American Petroleum Institute's spring meeting June 13-14 at the William Penn Hotel, Pittsburgh, according to Virgil Bowyer, chairman of the Eastern District of the API division of production.

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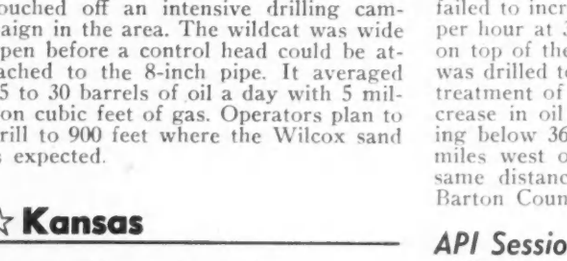

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☆ New Mexico

Seventh Ellenburger Producer Certain for Brunson Sector

Seventh Ellenburger producer assured for the Brunson sector of the Penrose-Skelly field; north outpost for Drinkard field is structurally low; Ellenburger test on south end is a failure.

Lea County: Repollo Oil Company's Brunson 4, ¼ mile north of the Brunson field, entered the Ellenburger at 7630 feet, or 45 feet high to the south offset, and logged normal porosity and saturation in drilling to 7883 feet, or 3 feet in solid granite. Pipe has been set to complete through perforations. Magnolia Petroleum Company's Brunson-Argo 11, recent east extension producer, was completed from perforations opposite sand underlying the usual Ellenburger dolomite instead of weathered granite as originally reported. It occupies the highest structural position, having entered the Ellenburger at 7425 feet, with elevation of 3426 feet, and the saturated sand at 7590 feet followed by solid granite at 7643 feet. Perforations were made at 7615-37 feet to determine if water was present, and the well registered a natural potential of 1632 barrels of 42.3-gravity oil and no water through ¾-inch choke. The dolomite pay has not been tapped.

Drinkard Field: The Texas Company's Blinebry 4, C SE SW 20-22s-38e, ½ mile north of Lower Yeso production, entered barren Glorietta at 5310 feet, being structurally low, and was drilling hard lime at 6795 feet. It may be situated favorably to encounter fully developed section below the Permian. The Lion Oil Company's Wylie 1, on the south flank of the structure, was abandoned after unsuccessful tests of nominal porosity in the Ellenburger. It was drilled to granite at 8519 feet, having logged Devonian, Silurian and Simpson beds for the first time in the area. Previous deep tests passed from the Permian to granite.

Paddock Field: Magnolia's Long 1, southwest edge of the Paddock field, flowed 274 barrels of 38.2-gravity oil initial through ⅜-inch choke after using 2000 gallons of acid through perforations at 5080-5125 feet. The Glorietta was topped at 5010 feet, with elevation 3349 feet. Neville G. Penrose, Inc.'s McCallister 1, C NW NW 7-22s-38e, east offset to Glorietta production in the Paddock field and south offset to 7100-foot Basal Yeso production, failed to indicate commercial production in either zone, and was awaiting orders in granite at 7673 feet. Granite wash was encountered at 7645 feet.

☆ West Texas

Reeves Wildcat Logs More Pay, Producing Big Lease Play

Reeves County deep wildcat logs additional pay, setting in moion a large-scale lease play; Dollar Hide structure rises sharply to north; south outpost for Martin field is failure in Ordovician series.

Reeves County: Argo Oil Corporation's Dora Roberts 1, C NW SE H&GN Ry. 294, Block 13, 7¾ miles northeast of Saragosa and 21 miles northwest of nearest production, touched

off a major lease play in the southeast portion of the county after several favorable drill-stem tests in the Basal Permian. A core pulled at 10,958 feet showed fair to good porosity and saturation, and a drill-stem test was pending. This wildcat was a failure in the Delaware series, topped at 5147 feet, with elevation of 2880 feet, but began showing nominal oil saturation and porosity below 9941 feet. Three drill-stem tests between 10,047 and 10,142 feet indicated possible production, while Basal Permian broken pay at 10,703-10,729 feet yielded gas to surface within 7 minutes, with maximum rate of flow estimated at 458,000 feet daily. The well headed 44-gravity oil briefly in pulling stem. A better production showing occurred when tester was used at 10,697-10,729 feet.

A small flowing well is virtually assured for Roberts 1, but the pay thickness and production performance will not justify a drilling program at this depth. Identity of the producing zone has not been definitely established, although generally considered to be Basal Permian. Comparatively few tests have been drilled through the Permian in the Delaware Basin, and a negligible number reached the Ordovician. Roberts 1 is 8¼ miles north by east of a Delaware failure.

Andrews County: Union Oil Company's Cowden 2, north offset to the discovery for the Dollar Hide field, developed a steady flow of 39-gravity oil when tester was used at 7600-7700 feet in Devonian, and was drilling at 7760 feet to determine thickness of the pay before setting pipe. Top of Devonian had not been called, but the well is credited with being about 170 feet high. The field's second completion and a west offset to the discovery recorded 46-foot dip in the Devonian, while Humble Oil & Refining Company's Cowden et al 1, 11/16 mile southeast of the discovery, had not reached the Devonian in drilling lime at 9520 feet. Magnolia Petroleum Company's Cowden 1-B, ⅜ mile northeast outpost, was drilling lime at 7390 feet. The latter has made location for Cowden 1-D.

Shell Oil Company's Nelson-Humble 1, which has been showing for an Ellenburger discovery near the west side of Andrews County, failed to boost its output in deepening from 10,488 feet to 10,504 feet, and was acidizing.

The Atlantic Refining Company-Wiggins and Hyde's University-Texu 1-A, C SE NE Sect. 9, Block 12, reworked failure in Ellenburger at 10,575-10,760 feet, failed to produce from multi-tests through perforations in Devonian, topped at 8140 feet. It will be plugged back to try for production in the Permian. Atlantic's University 1-B-12, 1-1/6 miles southeast, has suspended operations at 4965 feet. Numerous leases in the area expire November 14, unless productive.

Martin Field: Atlantic's University 1-D-11, 1-1/16 miles south of the older sector of the 3-pay area, entered the Ellenburger at 9050 feet, or 205 feet low to the field's discovery in this zone, and has plugged back from 9110 feet to try for production in the Simpson and Basal Permian. Skelly Oil Company's University 1-Z, 1⅓ miles southwest of this low well, entered the Simpson at 8805 feet, or 393 feet low, and was to plug back from 9212 feet to try for completion in 7600-foot Lower Permian, which indicated flowing production.

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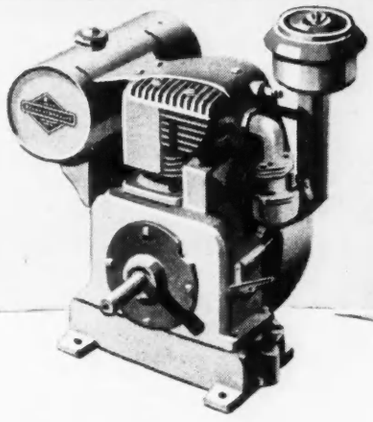

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Coopwood 1, a mile south of production in the South Fullerton-Devonian field, flowed 18 barrels of oil hourly natural through ½-inch choke on preliminary test of open hole at 6848-7002 feet. This production is from the Clear Fork (Fullerton), topped at 6855 feet, and the pay was passed up by 4 Devonian wells situated about 2½ miles northwest. A large area is open for immediate development.

Ector County: The Texas Company's T.P. Land Trust-Frazer 1-F, 2 miles north of the TXL field and ¾ mile northeast of an Ellenburger failure, was due to run a drill-stem test at 8612 feet in the Fusselman, topped at 8590 feet, or 94 feet high to the failure. This semi-wildcat is 32 feet low to the failure on the Devonian, which is eroded on top along the crest and the east side of the high. The Silurian was entered at 8220 feet, with elevation of 3334 feet. Nearest producer is Cities Service's Thomas 2-C, recent completion on the northwest side of the field, that flowed 2581 barrels of 44.2-gravity oil, with gas-oil ratio of 930/1, on natural test through ¾-inch choke. Production is from open hole at 9579-9780 feet in Ellenburger, topped at 9445 feet, being the highest in the field.

John W. Murchison et al's T.P. Land Trust-Texaco 1, 3½ miles south by west of the TXL field and structuraly low, entered the Devonian at 8510 feet, and was drilling dry chert at 8540 feet. Stanolind Oil & Gas Company et al's Kayser Unit 1, 1¼ miles southwest of the South Cowden (Foster) field, was fishing for cone at 11,531 feet in Devonian, topped at 11,390 feet. Cities Service's Parker-Wentz 1, ¾ mile southwest of the Harper field, was drilling lime and chert at 11,065 feet in Devonian, topped at 10,320 feet.

Midland County: Humble's Crespi 1, ¾ mile northwest of its Midland pool discovery in Pennsylvanian at 11,370-390 feet and a failure in this zone, was drilling lime at 11,483 feet in Devonian, topped at 11,400 feet, or 13 feet high. A drill-stem test at 11,428-11,478 feet yielded gas to surface within 2¼ hours, flowing at a rate of 50,000 cubic feet daily, with 150 feet of 49.2-gravity distillate in the stem. This showing is comparable to that made by the discovery, which was plugged back from the Ellenburger.

Sutton County: Shell's Wilson 1, 20 miles south by west of a gasser, nearest production, was showing a negligible amount of gas with hole full of water from Pennsylvanian perforations at 4220-45 feet, having plugged back from Cambrian sandy-lime at 6170 feet. The Ellenburger, entered at 4792 feet, was penetrated more than 1000 feet before reaching water.

Crane County: Humble's 2, ¾ mile northeast of its 9460-foot Ellenburger wildcat failure, was drilling black shale at 7190 feet, while its Cowden 1-B, 3 miles north by east, was drilling cherty-lime at 8515 feet. The latter entered the Devonian at 7674 feet, or 1559 feet low to the failure.

Atlantic's University 1-D-31, ⅔ mile northwest of the Block 31 discovery and 332 feet low structurally, was completed as the fourth producer in flowing 227 barrels natural through ⅜-inch choke from 5 zones of perforations at 8708-8933 feet in Devonian, topped at 8230 feet. This is the second 1-pay completion for the company, while it has 2 additional wells dually completed from the Devonian and Ellenburger.

☆ Central West Texas

Taylor County Wildcat Has Four Prospective Oil Zones

Taylor County wildcat has 4 prospective oil zones; deep prospect in Southeastern Jones County cased to test oil in Strawn; Marble Falls sand may be productive in the Sedgwick deep area.

Taylor County: West Central Drilling Company et al's Morphree 1, SE SE SE S.P. Ry. 1, Block 9, 1⅜ miles west by south of the Ingram 3-well pool, landed pipe at 3060 feet, or 2 feet off bottom, to test 4 promising oil zones. The Flippen was entered at 2578 feet with oil saturation at 2625-30 feet. The Upper Hope was topped at 2720 feet with saturation at 2750-60 feet, while shows were logged at 2815-20 and 2825-40 feet. The Ingram area produces from the Upper Hope at about the same subsea depth.

Jones County: Mantex Oil Company et al's Manley 1, T&P Ry. 72, Block 14, and a projected Ellenburger wildcat, filled 400 feet with oil from Strawn lime and shale at 3728-40 feet, and was halted at 3740 feet to set pipe at 3697 feet for a production test.

Shackelford County: Phillips Petroleum Company's Hickman-Nellen 1, northeast offset to its Sedgwick deep discovery, entered the Bend at 3825 feet, or 12 feet low, and recovered 325 feet of oil, 250 feet of oil-cut mud with some brackish water when tester was used in Marble Falls sand at 3936-50 feet. It will continue to the Ellenburger.

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Tracts located in Andrews, Crane, Crockett, Ector, and Upton counties; date of sale, June 7, 1946; to be held at the Stephen F. Austin Hotel, Austin, Texas, to begin at ten o'clock A.M.

For additional information write to the Secretary, Board for Lease of University Lands, University Station Box 2125, Austin 12, Texas.

☆ North Texas

Cooke County Wildcat to Set Pipe for Test of Strawn Pays

Western Cooke County wildcat will set pipe to test Strawn broken pays; Strawn failure noted near north line of Archer County; Second Ordovician test at Sivels Bend checking low.

Wildcats: Redman Bros. etc al's Wheeler 1, H. Ledbetter Survey and 2 miles southwest of the Bulcher multi-pay shallow field, Cooke County, encountered its first promising showing in the Strawn at 2397 feet, and logged more than a half dozen prospective oil zones in fulfilling depth contract at 3010 feet. These showings were confirmed by electrical formation survey, and owners are setting pipe to try for completion through perforations. In northern Archer County, Fain & McGaha's Huff 1, M. Fanning Survey, was abandoned in Strawn at 4397 feet.

Cooke County: Sun Oil Company and Standard Oil Company of Texas' Midkiff-Davis 1, Strawn failure on the southeast side of the Sivels Bend field, was drilling dry dolomite at 8890 feet. The Simpson was entered at 8180 feet, or 126 feet low to the field's single Ellenburger producer, which is credited with having dropped sharply in oil yield due to water encroachment.

Montague County: Continental Oil Company's Patty 1, northeast outpost for the McNutt 4-well Viola lime pool, was drilling at 6820 feet in Viola, topped at 6715 feet, becoming the highest for the field. A drill-stem test at 6734 feet confirmed oil production. This is the only Viola lime producing area in the state, and it is defined to the north and southwest. Continental and Sinclair Prairie Oil Company's Garlington 1, an Ellenburger prospect 1½ miles north of Bowie, was drilling shale at 5215 feet.

King County: Humble Oil & Refining Company's Bateman 21, west outpost for the Bateman Ranch field, was drilling at 5010 feet, having entered the first lime at 3638 feet, or 5 feet high to its Bateman 20, which recently expanded the field ⅝ mile northwest as the first prolific producer from the lower pay.

☆ East Texas

Offsets Given Paluxy Strike On Mount Sylvan Prospect

Two offsets given Paluxy discovery on Mount Sylvan prospect by Humble, and southeast outpost is within the producing contour through having entered Georgetown at 5954 feet; Crow prospect is failure in Paluxy.

Anderson County: Humble Oil & Refining Company's Freeman 1, Brushy Creek prospect, entered the transitional zone overlying the Travis Peak at 12,525 feet, and was coring at 12,560 feet without shows.

Cherokee County: Hunt Oil Company's Andrews-Pure 1, projected Travis Peak wildcat and 2 miles west by north of Jacksonville, was drilling at 4625 feet in Austin chalk, topped at 4555 feet with elevation of 497 feet. The Pecan chalk was entered at 3533 feet. There are no failures within reasonable correlation distance.

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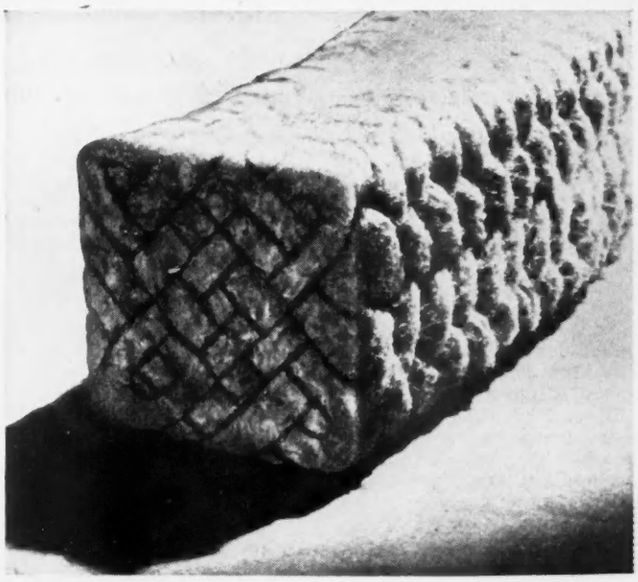

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duction outlook in flowing 552 barrels of 34.6-gravity oil, with gas-oil ratio of 145/1, on official gauge through ¼-inch choke. Working pressure on tubing was 400 pounds and 460 pounds on casing. This discovery is producing from perforations at 7339-52 feet in the Paluxy series, topped at 7292 feet, with effective pay at 7339-92 feet. The water zone was established at 7416-49 feet in drilling to 7668 feet in Dry Glen Rose.

Offsets to the north and east will be drilled promptly by Humble as the forerunner of an aggressive development program on its large block. Numerous independents hold leases on small tracts in Smith and Van Zandt counties, and applied for drilling permits during the 4 months that Pool 1 was cased and capped to cure titles.

Edwin Pace et al's Johnson 1, Andrew Kent Survey and ¾ mile southeast of the discovery, was drilling lime at 6450 feet, and checking favorably.

Van Zandt County: Delta Drilling Company's Martin 1, A. T. Flowers Survey and 3½ miles southeast of the Tundra 1-well pool, was slated to be plugged in sand at 9010 feet, having correlated low.

Henderson County: Lone Star Producing Company's Hearne-Magnolie 1, J. E. Clancey Survey and 2⅔ miles northeast of the single oil producer on the flank of the Opelika gas-distillate field, was setting pipe near bottom at 9495 feet. The Pettit was entered at 9360 feet, or 63 feet high to the oil well. This north flank test will be dually completed as a gasser in the Pettit, and as an oil well from the Rodessa at 8831-55 feet.

Lone Star and Magnolia Petroleum Company's Faulk-Wofford 1, situated 3900 feet southwest of the Larue 1-well pool, entered soft lime in the Bacon at 8243 feet, and was taking core before running drill-stem test. It is structurally low.

The discovery continues to make its allowable, and the crude is shipped by tank cars to a refinery at Regina, Canada.

Marion County: Magnolia Petroleum Company will take official gauge on pump to complete its Travis Peak discovery, Orr 1, Fowler Survey, 3½ miles southwest of Avinger. The well has been reported swabbing 100 barrels of oil per day and may pump an estimated 200 barrels per day. Perforations are from 7568-77 feet, with total depth 10,513, and 7-inch casing cemented on bottom. The well also had a gas-distillate show in the Lower Travis Peak through perforations at 9023-25 feet. An offset to the discovery will be announced soon.

Panola County: Marsh & Crain's Roquemore 1, David Blankenship Survey, north northwest flank of the Carthage field, was completed for an estimated 70 to 80 million cubic feet of gas daily. Well was bottomed at 6818 feet. This test is a 2-mile north extension of Carthage production.

The Chicago Corporation has located a 12,000-foot test, Carthage Gas Unit 20, S. House Survey, 4 miles northwest of Carthage townsite.

Michigan Hearing Planned

The Michigan statewide oil proration hearing will be held by the Supervisor of Wells and the Oil Advisory Board, Department of Conservation, at Lansing, May 14.

☆ South Central Texas

Amerada Continues Tests On Wildcat in Gonzales County

Amerada continues to test Gonzales County wildcat; circulation lost in Dan Auld's test in Edwards County; production tests made in Muil area well.

Gonzales County: Amerada Petroleum Company continues tests in an effort to make commercial production in Henderson et al Unit 1, wildcat in the James Gibson Survey, A-23, 5 miles southeast of Waelder. After drilling to 10,902 feet, operators plugged back to 9500 feet, from where level tests have been made up the hole. Drill-stem test conducted below 9500 feet showed mostly salt water, with a slight indication of gas. Electric logs showed top of the Edwards lime at 8770 feet. The well has been plugged back to 8535 feet and preparations were being made for further drill-stem tests. A test at 9587 feet developed no working pressure when the testing tool was left open 20 minutes.

Edwards County: Dan Auld's Hal C. V. Peterson 1, wildcat 6 miles northeast of Rock Springs on a 160-acre tract in the SE¼ of AB&M Survey 15, Block 2, was attempting to regain circulation after returns were lost while drilling at 4500 feet. Proposed depth is 5500 feet.

Atascosa County: Quintana Petroleum Company's C. Muil 2, J. C. Mattison Survey 467, 4 miles northeast of McCoy in the Muil discovery area and 1320 feet southwest of the C. Muil 1, discovery gas-condensate well, made a production test at the 9000-foot level in the Edwards lime where a little gas showed. Operators squeezed these perforations and are making preparations for another try. The 5½-inch casing was set to top of the Edwards lime near 9000 feet.

☆ Southwest Texas

Webb County Wildcat Yields Oil on Two Drill-Stem Tests

Webb County wildcat makes oil on drill-stem tests; Sun drills ahead in new discovery area; Garcia discovery well in Starr County sands up; Humble nears 7000 feet in Bass wildcat.

Webb County: Blanco Oil Company & Al Buchanan's Marrs McClean 2, wildcat 660 feet southwest of the McClean 1 dry hole in the Edginton Subdivision of the Albercas Grant has made 2 drill-stem tests and reached a total depth of 2262 feet. On the first test, made at 2257-58½ feet, the well made 130 feet of emulsion (50 percent oil) and 205 feet of salt water, developing 48 pounds working pressure and 130 pounds bottom hole pressure. When shut in, the well gauged 420 pounds pressure. A second test at 2260-61½ feet recovered oil and salt water.

Sun Oil Company's Isaac Hirsch et al 1-A, in the J. Poitevent Survey and 3650 feet northeast of the Hirsch 2, gas discovery well, and 25½ miles northeast of Laredo, set conductor pipe and was last reported drilling below 1650 feet with no significant indications encountered.

Starr County: George H. Echols' M. M. Garcia 2, wildcat test in the southeast corner of Block 29, Porcion 90, 1 mile northwest of the Boyle field and 2 miles southwest of the Rincon field, completed the latter part of April for 103 barrels of oil daily, was sanded up and the operators were making preparations to retest.

Jim Hogg County: Humble Oil & Refining Company's Mrs. A. M. Kelsey Bass 23, wildcat in the San Rafael Grant, 3000 feet northwest of the Bass 17, Kelsey field, was drilling near 7000 feet in shale. The last drill-stem test at 6727-38 feet recovered 30 feet of gas-cut mud. A previous test at 5988-6000 feet recovered 670 feet of gas-cut mud with a trace of oil.

☆ Lower Texas Coast

Gas-Condensate Strike Made in Willacy La Sal Vieja Section

Gas-condensate discovery made in La Sal Vieja area; gas producer indicated for new Sliva wildcat; Gyp Hill wildcat completes in shallow sands; discovery well southeast of Alta Mesa goes on pump; Hinnant field gets extension; Petronilla field is extended 3650 feet south.

Willacy County: Magnolia Petroleum Company and J. S. Abercrombie's O. E. Todd 1, wildcat in the La Sal Vieja area about 2 miles northwest of the field, has been completed for a gas-condensate discovery. The well flowed 10 barrel of 55-gravity condensate and 1,200,000 cubic feet of gas per day from perforations at 7540-60 feet. Choke size was not reported, but was considered to be relatively small. The well was drilled to 11,651 feet and 7-inch pipe set at 10,548 feet. Production tests made at the 9300-foot and 8600-foot level failed, and the operators plugged back to the shallower sands. Present production is from sands much shallower than the two deep sands of the field where the normal pay is at 10,000-040 and 8935-55 feet.

Bee County: Bridwell Oil Company's J. W. Baird 1, outpost test in the Sliva field, in the southeast corner of the J. G. Rountree Survey 8, and a mile west of the Sliva field discovery oil well, has set 5½-inch casing at 4407 feet with total depth 4411 feet. Operators will likely complete as a gas producer, since the well developed 280 pounds working pressure on a drill-stem test on gas sands in the Frio zone at 3536-44 feet during a 5-minute test. Gas sands were logged in the Vicksburg zone at 4398-4406 feet, however, no recovery was made on tests from 4406-11 feet.

Brooks County: Sun Oil Company's Mary M. Lasater 4-B, wildcat test on the Gyp Hill Dome in the northeastern part of the county about 6½ miles southeast of Falfurrias, has been completed for a shallow oil producer from the 4075-foot level pay sand. The well flowed 41.38 barrels of 43.7-gravity oil daily through a ¼-inch choke from open hole at 4070-75 feet. Tubing pressure during the flow gauged 30 pounds, while the casing was sealed. Total depth is 4075 feet with 7-inch casing set to 4070 feet and 2-inch tubing hung to 4066 feet.

Brooks County: Tom Graham's Prosper Mangell 1, new discovery 4 miles southeast of the Alta Mesa field, and in the southeast corner of Tract 4 on a 760-acre tract in the La Encantada Grant,

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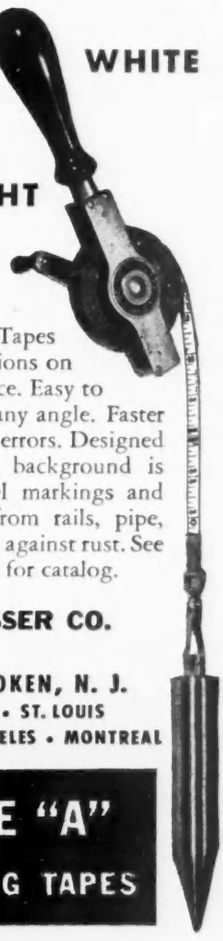

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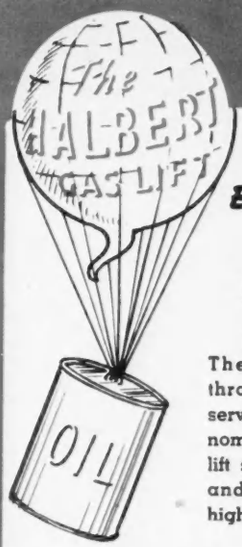

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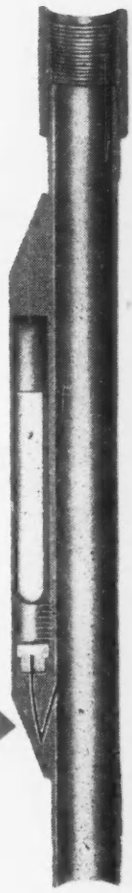

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has been put on pump. On production tests, the well flowed a small amount of 21.3-gravity oil and salt water from perforations at 6558-63 feet. Total depth is 7310 feet and casing is set to 6625 feet.

Live Oak County: Houston Oil Company et al's M. A. Hinnant 1, south extension discovery for the Hinnant field, and located near the center of the Alexander McDonald Survey A-286, has been completed for a gas-condensate producer. The well gauged 10.75 barrels of condensate through 5/16-inch choke from perforations at 5774-78 feet with tubing pressure at 2300 pounds. Shut-in pressure was 2750 pounds. A 65-minute drill-stem test made in the same perforations prior to completion recovered 75 feet of 49-gravity oil and no water. Total depth is 6510 feet with 5½-inch casing set to 5840 feet. This is a community operation by Houston Oil Company and Kirby Petroleum Company et al on Kirby's 160-acre lease.

Nueces County: Stanolind Oil & Gas Company's J. T. Gillette 3-A, semi-wildcat test southeast of production in the Petronilla field, being 3657 feet south of 1-A well, nearest producer, and in the Roberts & White Subdivision, has been completed to extend the field. The well flowed 85 barrels of 40-gravity clean oil per day on a drill-stem test from perforations at 6945-48 feet, which is considered the regular pay for that area. Flow was through a 3/32-inch top choke and ⅛-inch bottom choke, developing 900 pounds working pressure. Total depth is 9516 feet with 5½-inch pipe set to 6970 feet. Drill-stem tests conducted at 7315-22 feet in the 7300-foot sand showed salt water.

☆Upper Texas Coast

Sugar Valley Field Is Given Extension by Stanolind Test

Extension assured for Sugar Valley field; McCoy field discovery well reworked and completed for oil producer; new sand encountered in McCoy area; south Blessing wildcat prepares for production try; Midfields outpost ready for tests.

Matagorda County: Stanolind Oil & Gas Company's Helen C. Hurlock 1, Freeman Pettus Survey, approximately 1 mile north of the Culbertson well and 3000 feet northeast of the Thomasson 1, made a good show of oil on a drill-stem test to assure an extension of the Sugar Valley field. Well is coring below 9060 feet, but will test all sands encountered. On a 30-minute drill-stem test at 8981-87 feet using ⅜-inch and ¼-inch chokes, the well blew 30-gravity oil, mud and gas over the derrick, developing 3050 pounds working pressure at the well head. The flow was killed and 12 stands of clean oil were recovered with no evidence of salt water.

Matagorda County: Amerada Petroleum Corporation et al's Ike Laughlin 1, wildcat 3 miles southeast of Blessing, John Holmes Survey, was preparing for an initial production test after drilling the plug in 7-inch casing set at 10,105 feet. Total depth is 10,107 feet, near the horizon where the first test in the area was junked when the well attempted to blow out and stuck the drill pipe. A sidetracked hole was drilled in the first test, but was unsuccessful.

Sun Oil Company's First National Bank of El Campo 1, northwest outpost in the Midfields area, I&GN Survey 7, and 2091 feet northwest of the Strnadel 2 discovery, was attempting a production test from perforations at 9133-35 feet. A lower squeeze job was made through 8 perforations at 9145-47 feet prior to the pending test. Total depth is 9200 feet and 5½-inch casing is cemented on bottom.

Liberty County: The Ohio Oil Company's Kirby Lumber Company 1, discovery for the McCoy field and originally completed as a gas-condensate producer making 18 percent salt water and flowing 52 barrels of 54-gravity condensate and 1,167,000 cubic feet of gas daily, has been reworked and completed for an oil well. Original perforations at 9106-27 feet were squeezed and the pipe reperforated with 12 shots at 9108-9112 feet, from where the well now flows 96 barrels of 32.2-gravity oil daily through a 10/64-inch choke with 2350 pounds pressure on the casing and 525 pounds pressure on the tubing. This pay is known as the Kirby sand. Total depth is 10,285 feet and 7-inch pipe is set at 9272 feet.

Ohio's B. E. Quinn 2-A, a mile northeast of the McCoy discovery well in the Daniel Donahoe League A-24, 4½ miles east of Cleveland, has been completed as an oil producer in the Quinn sand. The well was gauged for 61.57 barrels of 32.4-gravity oil daily through ¼-inch choke from 24 perforations at 9125-31 feet. Gas-oil ratio was 386/1 with tubing pressure under the flow gauged at 60 pounds while the casing pressure was 1250 pounds. Total depth is 9800 feet and 5½-inch casing is set at 9204 feet. The well is reported to have cut a fault situated between it and the discovery well, and is producing from a different sand, though almost at the same level with the producing sands in the discovery well.

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☆South Louisiana

Confirmation Project Tests Deep Sand at Bayou La Fleur

New deep sand under test at Bayou La Fleur; Egan field has prospect of new pay horizon; new oil pay found at 13,000-foot level at Venice; New Gueydan producer given potential; new producer sure for Bon Air field; Mamou field has good confirmation producer.

Jefferson Parish: The California Company is testing a new, deep sand in its confirmation test at Bayou La Fleur with E. P. Brady et al 2, 34-16s-24e, northeast of the discovery well. A production test is under way after making a squeeze job through perforations at 10,483-485 feet. Total depth is 11,500 feet and 5½-inch pipe is cemented to 10,491 feet. The discovery well was completed through perforations at 9366-85 feet for a flow of 300 barrels of 38.7 gravity oil daily.

Acadia Parish: Sun Oil Company & Sohio Petroleum Company's Elizabeth Regan 3, 31-9s-1w, east side of production, was expected to test a new, deep pay horizon for the field. The well was drilled and cored to 13,500 feet. An electrical log was run and sidewall samples taken before setting 5½-inch pipe to 11,986 feet. Cement plug has been drilled and preparations are being made to perforate for production tests.

Union Sulphur Company's C. C. Hudson 2, new well for Bayou Mallet, 51-7s-1e, has been completed for an initial gauge of 40 barrels of 37-gravity oil daily through 6/64-inch choke from perforations at 8538-42 feet. Gas-oil ratio was 800/1 and tubing pressure under the test was 650 pounds. Total depth is 8873 feet.

Plaquemines Parish: Tide Water Associated Oil Company's Buras Levee District 29, in the southeast corner of 21-21s-30e, has been completed in a new and deeper pay for the Venice field. The well has been tested for 326 barrels of 38.8-gravity oil daily through a 7/64-inch choke from perforations at 13,000-017 feet with a tubing pressure of 4300 pounds. Total depth is 13,020 feet and 5½-inch pipe is set to bottom.

Vermilion Parish: Fohs Oil Company's Simon-Campbell 2, new producer in the Gueydan field, 36-11s-1w, has been given a potential of 275 barrels daily of 34.2-gravity oil, no water, through a 9/64-inch choke with 1500 pounds pressure on tubing and 2000 pounds on casing. Total depth is 10,311 feet with perforations at 9968-80 feet.

Jefferson Davis Parish: Sohio's Claudius Fontenot et al 2-B, west offset to No. 1-B in the Bon Air field, 16-10s-6w, has been cleaning into pits and is certain to make a new producer for the field. Lower water sands were sealed off with a squeeze job through perforations at 9712-14 feet and the well perforated for the completion with 12 shots at 9701-03 feet. Total depth is 9757 feet and 5½-inch casing is cemented at 9755 feet. An initial gauge is expected shortly.

Evangeline Parish: Magnolia Petroleum Company's O. L. Guillory 1, confirmation well for the Mamou discovery area and northwest offset to the Marein 11, discovery well, and located in 6-5s-1e, has been completed in the discovery pay level with production from perforations at 11,577-587 feet. The well was gauged for 270 barrels of oil daily through ⅜-inch choke with gas-oil ratio 1800/1. Total depth is 11,641 feet.

Washington Parish: Humble Oil & Refining Company's Gaylord Container Company 1-B, wildcat in the Angie area just below the Mississippi state line in 42-1s-14e, is drilling in sand and shale below 10,105 feet. The last drill-stem test was made at 9288-9306 feet where 180 feet of mud and 7020 feet of salt water were recovered.

☆ North Louisiana

Oil, Gas, Salt Water Tested By Wildcat in Caddo Parish

Caddo Parish wildcat reported testing oil, gas and salt water; Blue Lake field extended; Knowles field, Lincoln Parish, defined to north.

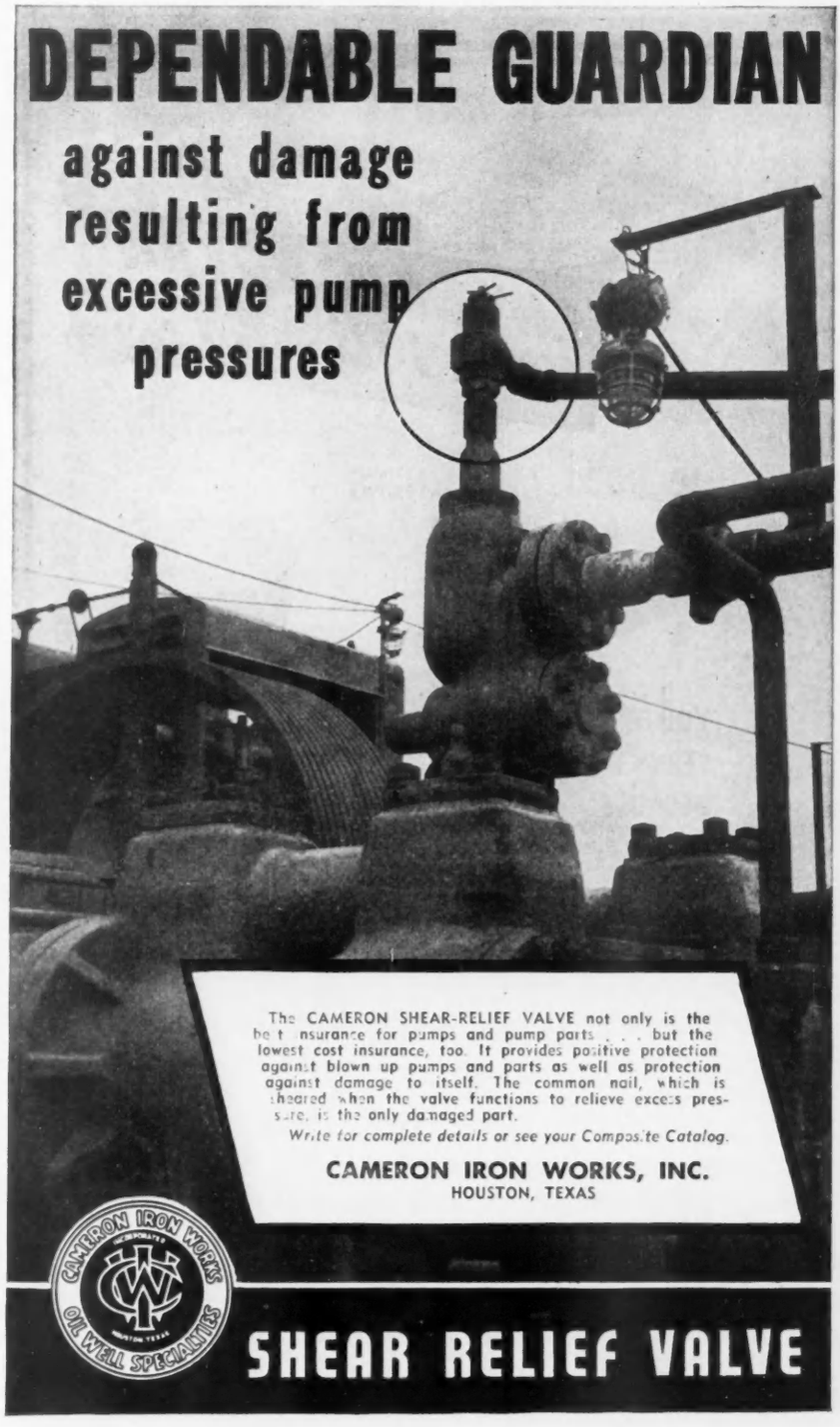
Caddo Parish: A. Paul Gilbert's Thompson 1, wildcat is 15-22-16, Pine Island area, reputedly set 2879 feet of 5½-inch casing and tested oil, gas and salt water through perforations from 2575-80 and 2102-10 feet. Total depth is 2955 feet.

Claiborne Parish: The Ohio Oil Company and Gulf Refining Company's Bond-Beene Unit 1-H, 22-23n-8w in the old Haynesville field, is producing from a new deep pay in the Smackover rather than the Cotton Valley as was announced on completion of the well last week. Leasing is very active on the south flank of the field and the southwest flank of the East Haynesville field. The well is producing 52-gravity distillate through perforations from 9990-10,130 feet. Smackover was topped at 9945 feet, after the Bond-Beene 1-H cut a fault of 950 feet. The new pay discovery is 1 mile southwest of Ohio's Taylor 15, 15-23n-8w, which went to 11,038 feet in 1940 and was abandoned after finding only small shows of gas in lower horizons. Lisbon field is the only other Louisiana reservoir producing commercially from the Smackover, and is also in the eastern part of the parish.

Lincoln Parish: The California Company's W. A. Colvin 1, 1-19n-4w, was abandoned at 8808 feet after failing to obtain production from the Cotton Valley. This test defines the northern limits of the Knowles field, formerly called the Hico field. Colvin 1 is 1 mile north and ¼ mile east of the discovery well but was 125 feet lower on top of the Cotton Valley, from which production was sought.

Bossier Parish: Barnsdall Oil Company's Crystal Refining Company 1, wildcat in 28-21-11w, Ivan area, was abandoned at 9072 feet. The well had trouble from 7050 to 8196 feet. Barnsdall's other wildcat, Carter-Burton 1, 26-23-13w, was preparing to core at 10,181 feet. Plans are to continue the well to 12,000 feet to test the Smackover.

Sabine Parish: Panhandle Oil Company's D. E. Meshell 1, 22-7-14w, Blue Lake extension, 10 miles west of Zwolle, was reported making 42 barrels of 49-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gravity oil per hour through a ⅜-inch choke, and 35 barrels when flowing through ¼-inch choke. Production is from perforations at 2180-2200 feet, total depth 5080 feet; 5½-inch casing was set at 2582 feet. After perforations tested salt water from 2480-2500 feet, cement retainer was set and perforations made higher up for production. Following perforations the well was acidized and came in flowing. The well was shut in awaiting tanks prior to March 21. After testing during April it was reported good for estimated 400 barrels daily.

Richland Parish: Lyons & Prentiss prepared to test John S. Lowery 1, SE SE NW 7-16n-8e, a location to the south of Big Creek production. The well is bottomed at 2001 feet. Electrical log indicated oil sands at 2916-21 and 2984-87 feet.

☆ Arkansas

Wesson Outpost to Be Tested; Two New Projects to Start

Wesson field outpost prepares to test; Ouachita County wildcat waiting on orders; new wildcats starting in Ouachita and Little River counties.

Ouachita County: McAlester Fuel Company's R. B. Allen A-3, SE SW NE 24-15s-19w, Wesson field northeast outpost, set casing at 2600 feet, after drilling to 3601 feet and running electrical log. Best shows were in the Tokio sand, and the hole was plugged back to that level to test. McAlester completed C. M. Wesson A-3, NW NE SW 24-15s-19w, Wesson field, for 180 barrels in 10 hours through ⅛-inch choke on tubing. Oil was of 33.2-gravity. Casing was perforated at 3082-92 feet. This is the best gauge of any of the 16 wells now drilled in the area.

Foster & Green's Emma Campbell 1, wildcat in 10-15s-19w, was waiting on orders after drilling to 4312 feet and running electrical log. Travis Peak was topped at 2757 feet, Cotton Valley at 3900 feet. Hunt Oil Company's Dawson 1, wildcat in 14-15s-18w, was drilling at 5500 feet toward the Smackover lime. Start of S. J. Felsenthal's H. H. Medlock 1, wildcat test in C SE NE SW 29-15s-18w, 1½ miles southeast of the Wesson field, has been delayed because of rains.

Little River County: K. E. Merren's J. D. Shaver 1, 36-12s-31w, is a new wildcat test soon to begin operations. The test, which is 2 miles northeast of an abandoned well in 2-13s-21w that logged showings of oil in the Paluxy section, will seek Glen Rose production.

Union County: The Arkansas Oil & Gas Commission has reclassified the Salem Church field as a gas field with 1 million cubic feet of gas per day allowed to the 3 producers. The field allowable had previously been 125 barrels of oil per day.

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☆ Mississippi

Wildcat Activity Stepped Up; Hub Field Has New Pay Level

Activity increases rapidly after several months of quiet; new productive levels indicated for Marion, Lamar County fields; Kings field gasser on verge of completion.

Marion County: Humble Oil & Refining Company's E. A. Ball 3, NWc 20-2n-14e, Hub field, has definitely established a new potential productive zone for the field far below present limits. In a drill-stem test at 10,102-112 feet, shows of gas-condensate were recovered, and in a subsequent test at 10,112-120 feet, fair quantities of 49.5-gravity oil were recovered. Further tests at 10,123-130 feet also produced good shows of oil and oil-cut mud although salt water input was considerable. All tests so far indicate a fairly thick productive section of sand with excellent possibilities for commercial development. Previously, the well established commercial production in the Marine Tuscaloosa, producing zone of the field, at 9118-22 feet with 165 feet of 40.7-gravity oil recovered in a 20-minute test. Ball 3 is an offset of Ball 2, which was brought in about 6 weeks ago as a gas and condensate producer from the Marine Tuscaloosa. The well is now drilling below 10,237 feet.

Lamar County: Gulf Refining Company's Virgil Davis 1, NEc SE 7-1n-16w, Baxterville field, encountered shows of gas from the Wilcox horizon, the first in that zone for the field, and the first of any cosnequence encountered outside of the Mississippi River counties. Cores taken in several sections between 4844 and 4902 feet recovered sand with good odor. Drill-stem test at 4854-70 feet recovered a small amount of 54.8-gravity condensate and mud in 11-minute test. Producing zones for the field are the lower Tuscaloosa and the Massive sand with several dual comple-

tions producing gas and condensate from the upper horizon in the vicinity of 7700 feet and a low-grade oil from the lower zones below 8600 feet. Amerada Petroleum Corporation's Anton Vesely 1, SW NE 7-4n-15w, wildcat, was waiting on cement after setting surface casing. The well will go to 8000 feet.

Lincoln County: Roeser & Pendleton's School Land 1, NW NW 16-7n-7e, Brookhaven field, apparently has been assured of commercial production and is continuing tests. Production is from 162 perforations opposite the Massive sand between 10,316-343 feet and the well is flowing 10 barrels of 37-gravity oil per hour. The California Company's J. C. Arrington 1, NEc 32-8n-7e, Brookhaven, is running core tests in the Comanchean horizon below 10,500 feet with no shows reported. California's Ras Smith 1, NEc 8-7n-7e, Brookhaven, has entered the productive Massive sand zone and is preparing to run tests.

Wilkinson County: Danciger Oil & Refining Company's Geo. W. Armstrong 1, 5-4n-2w, deep test, is drilling below 10,515 feet with no shows. Cores taken below 10,485 feet recovered gray shale and streaks of sand.

Yazoo County: Union Producing Company's J. E. Twiner 3, NWc 1-10n-3w, Tinsley field, has been successfully drilled deeper and completed as a producer from the Brumfield sand topped at 5771 feet. Casing was perforated at 5785-91 feet and with packer at 5772 feet, well flowed 55 barrels of 50-gravity oil on 8-hour test.

Warren County: Magnolia Petroleum Company's S. D. Finlay, in SE SW SE 27-17n-4e, newly discovered Kings field, was preparing for completion after production tests established satisfactory flows of dry gas. The field is rapidly being developed with the Ruth Pidgeon 3 being staked by Magnolia in SW SW SW 26-17n-4e.

Claiborne County: Sun Oil Company is building roads to resume work on W. R. Hammett 3, 15-11n-1e, which has been shut down for some months. The well was drilled to 1052 feet in lime before activities ceased.

Tennessee

Stevens Petroleum Company's wildcat on the Mitchie Prospect, southeastern corner of McNairy County, was reported pulling string of 8½-inch casing at 3000 feet and preparing to ream to straighten crooked hole.

Alabama

The Carter Oil Company's Rex Alman Unit 1, SW SE NE 4-10n-3w, East Gilbertown field, Choctaw County, is continuing tests in an effort to eliminate heavy salt water input. After the well was put on the pump it ran 10 barrels of oil and 46 barrels of salt water per day. total depth is 3302 feet.

Winston County: Glen D. Rose Oil & Gas Company's First National Bank of Birmingham 3, SWc SE 7-12s-8w, only active wildcat in the state, has resumed drilling and is working below 1135 feet in the Bangor lime section.

Montgomery County: S. D. Suggs' Suggs Fee 1, SE SE 19-15n-17e, is a new wildcat location. Contracted depth has not been announced.

Georgia

James E. Weatherford's H. Wilkes 1, Military District 1567, ½ mile west of Higgston, Montgomery County, is drilling below 2903 feet with no shows.

☆ Florida

Collier County Well Renews Interest in Sunniland Field

Humble Oil & Refining Company's Gulf Coast Realty Company 6, SW NE 19-48s-30e, Collier County's assured commercial producer, has renewed interest in the Sunniland field; well flowed at the rate of 216 barrels per day. Section of open hole between 11,558-78 feet in lime was tested and flowed 254 barrels of 25.9-gravity oil per day through 5/32-inch choke with tubing pressure 335 pounds and gas-oil ratio 76/1. A subsequent test yielded 246 barrels of oil per day under the same conditions. Testing continues.

Monroe County: O. D. Robinson's State 1, NEc NW 29-59s-40e, deep wildcat, has again reported slight stains in cores from 11,878-955 feet. Core tests continue below 12,000 feet.

Gulf Refining Company's State 1, SWc 2-67s-29e, wildcat, is working below 6151 feet with no shows. Cores taken in the 5700-5900-foot zone recovered lime.

Hillsborough County: Humble Oil & Refining Company's T. S. Jameson 1, NE NE 7-31s-22e, wildcat, is drilling below 8673 feet with no shows.

Hernando County: The Ohio Oil Company's Hernasco Corporation 1, NWc 19-23s-18e, is drilling below 6972 feet with no shows.

Dixie County: Stanolind Oil & Gas Company and Sun Oil Company's Per-

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petual Forest 1, NW NW 5-11s-11e,* 6000-foot test, is drilling below 1412 feet after running casing.

Levy County: Sun's J. P. Goethe 1, SWc 31-14s-17e, is drilling below 1689 feet in its drive for the 5000-foot zone.

☆ Rocky Mountain Area

Cat Creek, Montana, Program Is Begun by Farmers Union

Cat Creek, Montana, drilling program begun by Farmer's Union; Worland area takes Wyoming spotlight.

Montana

Farmers Union Central Exchange of Minneapolis is starting on its choice Cat Creek acreage now that legal difficulties have been settled by a Montana court decision. First location on the big co-op's Cat Creek acreage is in SW SW SW 16-15n-30e, offsetting one of Continental Oil Company's Brown lease producers to the west and one of Dave Schrock's flowing wells on the Fifer lease to the south.

Phillips Petroleum Company joined the Cat Creek play with purchase of a tract of government land at $101.55 an acre. The land is in the highly productive Mosby Dome sector.

Wyoming

The Worland area has several new wildcat locations and development activities are being pushed in areas already proved. The Pure Oil Company is drilling 3 wells on the River Dome in Washakie, near Worland, and General Petroleum Corporation is building a derrick for a wildcat at Worland.

In Hot Springs at Zimmerman Butte, between Worland and Thermopolis, Pacific Western Oil Corporation is completing its second well and extending the productive area by at least 150 acres. The well is now drilling plug after running casing to 4335 feet. The third Pacific Western well is a location, known as Hilliar-Government 35.

School Reorganized

The reorganization of the "department of petroleum engineering" at the Colorado School of Mines at Golden as the "department of petroleum production engineering and the department of petroleum refining engineering," has been announced. Heading production engineering will be Professor Clark F. Barb, now head of the department of petroleum engineering and director of the petroleum research being conducted under the Colorado Industrial Development Research program.

Professor James O. Ball, associate professor of petroleum engineering since 1938, has been named head of the new department of petroleum refining engineering.

Wyoming Meeting Set

The first annual field conference of the Wyoming Geological Association will be held in the latter part of July or first part of August in central and southeastern Wyoming, Ross L. Heaton, association officials, has announced.

☆ Illinois Basin

First Strike in Year Made In Clinton County, Illinois

Small pool opener north of Centralia production is first discovery for Clinton County, Illinois, in more than a year; Wayne County new pay discovery for Keensville pool is gauged; Hamilton County has prospective pool opener; Mattoon pool gets good well; Smith-Mills pool, Henderson County, Kentucky, extended.

Illinois

Paul Doran's Thomas 1, NW NE NE 13-3n-1w, Clinton County, 3 miles north of Centralia pool production, has opened a small pool and is the county's first discovery in more than a year. The well pumped 90 barrels of oil and 12 barrels of water in the first 12 hours after a 5-quart shot in Cypress sand at 1415-25 feet.

Wayne County: M. J. Mitchell's Cornstubble 2, NW SE SE 28-1s-5e, which opened a new pay horizon for the Keensville pool, was completed for 869 barrels of oil daily from McClosky lime, natural. Pay was encountered at 3100-10 feet.

Hamilton County: H. C. Hageman's McGee 1, SW NW NW 3-7s-5e, is a prospective pool opener with casing set at 3444 feet for test of McClosky break at 3386-91 feet. The well is west of Rural Hill.

Coles County: Gordon Oil Company's Davidson 1, NE NE SE 34-12n-7e,

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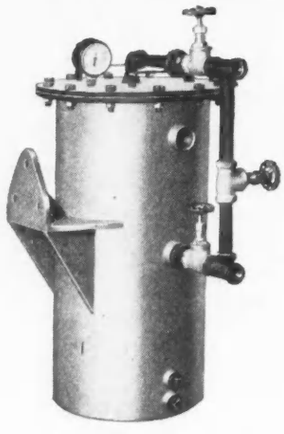
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southern part of the Mattoon pool, was completed for one of the best wells in the pool and one of the largest producers in recent weeks. It yielded 850 barrels of oil per day natural in Cypress sand at 1789-1835 feet.

Vincent Nolan's Coombes Estate 1, NE NE SW 23-14n-7e, wildcat more than 8 miles north of Mattoon pool production, was testing after swabbing a barrel of oil hourly from Rosiclare sand.

Kentucky

Henderson County: Sinclair Oil Company has given the Smith-Mills pool a ½ mile southern extension and excellent producer at Humphrey 1, 5-P-21. The well kicked off with a flow of 250 barrels of oil in 3 hours and then flowed 1025 barrels in the next 21 hours from McClosky lime at 2550-65 feet. The well flowed without treatment.

☆ Michigan

Mecosta Discovery Makes 48 Barrels on 10-Minute Gauge

Rex Oil & Gas Company's Skalitzky-Weller 1, NW NW SE 8-14n-7w, Mecosta County, a mile southeast of an unsuccessful play made a year ago, logged Dundee dolomite at 3700 feet and at 3701½ feet drilled pay formation. The well filled and flowed in 15 minutes, gauging 46 barrels the first 50 minutes. Later it made 48 barrels on a 10-minute gauge after being shut in for 20 minutes. No other production test was made, with the well shut in to wait construction of storage and transportation facilities.

The Carter Oil Company, which supported the test, dominates the lease acreage picture in the area with Rex, Sohio Petroleum Company, Skelly Oil Company and Gordon holding scattered leases within a mile radius of the test. Rex's well showed a 9-foot raise over the old Smith Petroleum Company wildcat on the Otrwein 1, in 7-14n-7w, which was produced for about 3 months, making from 50 barrels down.

Bay County: Sohio and Associated Petroleum Company's State 1, SE NE NE 1-17n-3e, 6 miles south of the Adams field, which was completed in March as a 16-barrel discovery, has been abandoned after deepening from 2970 to 2977 feet. Production on pump dropped to a negligible point.

☆ Canada

Taber Area, Alberta Plains Has First Flowing Oil Well

The Taber area on the Southeast Alberta Plains has its first flowing oil well. It is making 250 barrels of 23.7-gravity oil per day with gas-oil ratio 250 cubic feet per barrel, through ¼-inch choke. The well is Standard Oil Company of British Columbia and Nassau Explorations Ltd.'s joint Taber-Province 65-15A, West Tabor pool southwest extension in SW lsd 11 15-9-17w4. Casing pressure was 300 pounds and tubing pressure, 200 pounds. Previous to production test, a 24-hour bottom-hole static measurement showed 1430 pounds. The well is continuing potential tests. Bottom is at 3220 feet, with 7-inch casing at 3193 feet, at the top of the Taber (Lower Cretaceous) oil sand.

Imperial Oil Ltd. has stepped out several miles northwest and south for its next pair of wildcats in its gas exploration program on the Central Alberta Plains. The new ventures are Imerial-Kinsella 10, lsd 10 29-49-13w4, 4½ miles northwest of the current producing limits of the Viking field; and Imperial-Kinsella 13, lsd 10 15-46-10w4, 9 miles southeast of the Kinsella field, and 5 miles west of the most southerly Imperial gas well in the East Kinsella area. The Imperial program to date has netted 6 successful gas well completions spaced over 4 townships extending over 12 miles east of the Kinsella gas field; 2 failures in the line of townships east of this big proven area; and 2 failures in the line of townships north of the Kinsella field. The area proven up by the successes is believed in excess of 100,000 acres. Source of gas is the Viking sand (Upper Creatceous) found at depths to 2300 feet.

British American Oil Company Ltd. is spending $500,000 on additional equipment for handling heavy crudes at its Calgary, Alberta, and Moose Jaw, Saskatchewan, refineries. The move reflects the Prairie Provinces' decline in output of lighter crude from Turner Valley, and the progressive increase in production of heavy crudes (14 to 35 gravity) on the Alberta and Saskatchewan Plains. Vacuum units for vacuum reduction of heavy crudes are being installed at the 2 refineries, permitting manufacture of a wider range of asphalt products and very substantially increasing Prairie Province facilities for handling of heavy crudes. The new units are expected to go into operation this fall.

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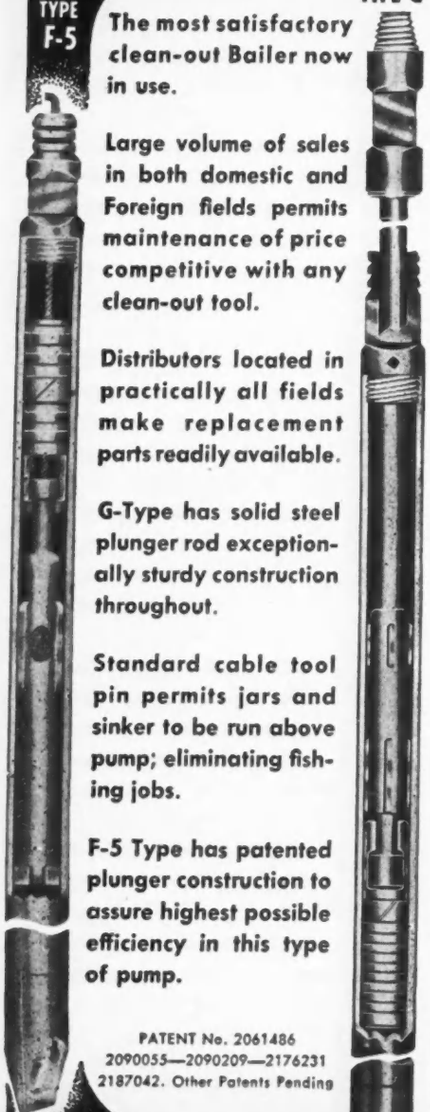

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EXPLORATORY COMPLETIONS

CALIFORNIA WILDCATS

Kern County—Failures: General Petroleum's B.M.Q. 1, 20-11n-23w, Santiago-Midway-Sunset area, abnd 4768.

Gene Reid Drilling's Deepwell 63-X, 4-26s-27e, Dyer Creek area, Vedder 2912 ft, abnd 2930.

Superior's L. & B. 64-20, 20-29s-21e, Cymric area, abnd 3841.

ILLINOIS WILDCATS

Christian County—Failure: M. H. Richardson's Gregory 1, se se sw 11-15n-2w, abnd 1965.

Clay County—Failure: B. M. Heath et al's Songer 1, se se ne 15-2n-5e, abnd 3000.

Clinton County—Failure: T. M. Conray et al's Noramn 1, ne ne sw 17-3n-1w, abnd 2905.

Coles County—Failures: B. A. Baker's Miller 1, se ne nw 6-11n-8e, abnd 2213.

Charles Venn et al's Behrend 1, se se sw 29-13n-8e, abnd 2061.

Cumberland County—Failures: Dave Black et al's Remmert 1, se sw ne 33-11n-7e, abnd 2208.

Ashland O&R's Lovall 1, se se se 8-10n-7e, abnd 2291.

Gallatin County—Oil Discovery: Deep Rock Oil Corp.'s Pioneer Comm 1, nw ne se 2-8s-8e, pumped 19 bbls day, O'h 2853-62 ft, td 2980.

Gallatin County — Failure: Herndon Drlg. Co.'s Harrington 1, nw nw nw 3-8s-9e, abnd 3120.

Greene County—Failure: National Consumers Oil's Hargrove 1, sw nw se 16-11n-12w, abnd 2372.

Jasper County—Failure: J. L. Black's Kepley 1, nw nw nw 20-5n-8e, abnd 3059.

Jersey County—Failure: W. Wright's Berryhill 1, n½ se nw 9-6n-13w, abnd 2836.

Madison County — Failure: Kingwood Oil Co.'s Karsmeyer 1, se se se 20-5n-5w, abnd 1961.

Macoupin County—Failure: C. R. Craft's Drew 1, sw se sw 28-9n-6w, abnd 2266.

Marion County — Failure: A. J. Slagter's Wendling 1, ne ne sw 28-2n-4e, abnd 2847.

Richland County—Failures: Walter Duncan's Hawkins 1, se se nw 3-2n-9e, abnd 3261.

Ralph Halbert's Murvin 1, w½ nw sw 4-2n-10e, abnd 3303.

Shelby County—Failure: C. B. Mansfeld's Barkhurst 1, se sw se 8-10n-3e, abnd 1950.

St. Clair County — Failure: West Basin O&G's Obal 1, se se sw 14-2n-8w, abnd 1450.

White County—Discovery: Sun's Okerson 1, nw sw ne 9-7s-8e, pumped 12 bbls oil day, McCl 3099-3106 ft, td 3114.

White County — Failure: New Penn Dev. Corp.'s Pottorff 1, ne ne nw 20-3s-9e, abnd 3461.

INDIANA WILDCAT

Gibson County—Failure: T. C. Billups' Epperson 1, se se se 9-4s-11w, abnd 2126.

KANSAS WILDCATS

Butler County—Failure: E. H. Adair's Clark 1, nw ne se 32-25s-4e, Viola 2649 ft, abnd 2652.

Deep Rock's Hodge 1, se se nw 7-27s-4e, Arb 3065 ft, abnd 3085.

Ellsworth County—Failure: C. E. Ash's Linke "A" 1, se se nw 29-17s-8w, Viola 3295 ft, abnd 3362.

Decatur County — Failure: Helmerich & Payne's Bailey 1, ne ne ne 14-3s-27w, Arb 4008 ft, abnd 4176.

Graham County—Failure: Tom Palmer's Parker 1, sw sw sw 36-6s-21w, Arb 3774 ft, abnd 3794.

Phillips County — Failure: Helmerich & Payne and Tidewater's Kinter 1, sw nw nw 20-4s-19w, Arb 3492 ft, abnd 3832.

Rooks County—Failure: Goodpasture et al's LeSage 1, se se ne 18-7s-20w, Arb 3575 ft, abnd 3604.

Sheridan County—Failure: H & T Drlg's Harold 1, sw sw sw 11-6s-28w, Arb 4519 ft, abnd 4529.

Stafford County—Failure: Plains Exploration's Waples 1, se sw sw 13-23s-12w, Arb 3816 ft, abnd 3835.

NORTH LOUISIANA WILDCATS

Lincoln Parish—Distillate Discovery: Calif. Co.'s Ida Rogers Richards 1, 11-18n-2w, Cotton Valley 8100, Bodcaw 9096, perf 42 shots 9109-16, flow 210 bbls 63.6-gr, ¼-in. gor 21,8100/1, tp 3600 lbs, td 9343.

Madison Parish—Failure: Pres. Cochrane's Frazier 1-A, se ne sw 15-17n-10e, abnd 4011.

Sabine Parish—Failure: L & L Oil Co.'s Pelican State Bank and Burr 1, 25-10n-13w, abnd 2045.

SOUTH LOUISIANA OUTPOST

Beauregard Parish—Failure: L. D. Cain Drlg. Co.'s W. I. Cooley 1, 660 n 330 w of sec 20-6s-9w, abnd 6926.

SOUTH LOUISIANA NEW PAY TEST

Plaquemines Parish—Venice Oil Discovery: Tide Water's Buras Levee Distr. 29, 330 n&w sec 21-21s-30e, pay 13,000, perf 66 shots 13,000-17, flow 326.3 bbls 38.8-gr oil, 0.1% wtr, 7/64-in. gor 1900/1, tp 4300 lbs, td 13,020.

MICHIGAN WILDCATS

Cass County — Failure: Clayton Development's Carmer 1, se sw sw 16-8s-15w, abnd 675.

Newaygo County—Failure: Michigan Consolidated's State 1, c se 31-14n-11w, abnd 1117.

NEW MEXICO NEW PAY COMPLETIONS

Lea County — Drinkard Field Ordovician Failure: Lion Oil's Wylie 1, 2160 ft snl and 660 ft ewl 5-23s-38e, elev 3385 ft, Yates 2710, San Andres 4120, Florietta 5280, Tubb 6200, Devonian 7450, Fusselman 7630, Simpson 7660, McKee 8041, Ellenburger 8396, Granite 8518, abnd 8519½.

OKLAHOMA WILDCATS

Canadian County—Discovery: Fox & Fox's Simpson 1, se se sw 9-14n-5w, flow 8 bbls oil day.

Murray County—Failure: W. H. Morrow et al's Wolf 1-A, nw se sw 8-1n-2e, abnd 2892.

Okfuskee County—Failure: W. M. Dunn's Gormley 1, nw nw se 11-13n-10e, Viola 2180 ft, abnd 2808.

WEST TEXAS WILDCATS

Glasscock County—Junked: C. T. McLaughlin et al's Neal-Shell 1, c se ne T&P Ry. 48, blk 33, T-3-S, elev 2745 ft, jkd and abnd 410 ft, skid 20 ft east.

Kent County—Oil Discovery: Humble's Lida Vick 1, c nw ne H&GN Ry. 45, blk 5, 1½ mi w by n of Polar; 6¾ mi e by s of Justiceburg pool; 105 mi w by n of nearest Ellenburger production, elev 2332 ft, San Andres 1550, Clear Fork 2680, Wichita Albany 3480, Ellenburger 7773, flowed 207 bbls 38.6-gr oil, plus 3.3% bs&w, gas-oil ratio 290/1, via ¼-in, acidized 2000 gals Ellenburger perf 7775-7810 ft, td 7938 ft in water, pb to 7890 ft.

Mitchell County—Failure: Stanolind-Cosden Pet. Corp.'s Dunn 1, c sw ne L. N. Co. 64, blk 20, elev 2228 ft, Grayburg 1975, San Andres 2200, Glorietta-Holt 2770, Clear Fork 2970, abnd 5504.

Yoakum County—Failure: John W. Murchison's Kirkpatrick-Sun 1, c ne ne sec. 66, blk D, J. H. Gibson sur, 2 mi s Landon pool, elev 3803 ft, anhydrite 2330 ft, Yates 2970 ft, brown lime 3880, San Andres 4440, abnd 5194.

WEST CENTRAL TEXAS WILDCATS

Fisher County—Failure: Great Western Honolulu Oil's Kiser 1, 6700 ft nsl and 330 ft wel of Geo. W. Crowls sur 325, or 330 ft out of NEc 121½-ac tr, elev 1818 ft, Noodle Creek lime 2870 to 2925 ft, Saddle Creek 3080, abnd 3300.

Jones County—Failures: Oscar Donley et al's Higgs 1, 330 ft out SEc T&P Ry. 3, blk 15, elev 1617 ft, abnd 2300.

Geochemical Surveys, Inc's Jefferies-Humble 1, 3000 ft snl and 467 ft from m/w/e line of T&P Ry 4, blk 17, elev 1715 ft, Luederes lime 680, Wolfcamp 1515, Dothan 1987, Noodle Creek 2075, Tannehill 2255, Flippen 2390, abnd 2802.

NORTH TEXAS WILDCATS

Archer County — Failures: Bridwell Oil's Duckworth 1, 1700 ft nsl and 800 ft ewl blk 5, Harris subdiv, abnd 1431.

R. Dawson & Barnes' Abercrombie 2, 150 ft wel and 1280 ft nsl of w½ blk 152, J. W. Harris subdiv, abnd 1250.

Clay County—Failures: Gus Blakely et al's Scott 1, 750 ft nsl and 590 ft wel blk 69, Wood CSL, abnd 1210.

Wayne McCormick et al's Graff 1, 858 ft ewl and 150 ft nsl sec 76, Parker CSL, abnd 315.

Cooke County—Failure: Hollandsworth Dr. Co.'s Trew 1, 2860 ft snl and 330 ft ewl 168-ac tract, M. Langham sur A-564, abnd.

Foard County—Failures: Magnolia's Steele 1, nw sw sw H&TC Ry. 307, blk A, elev 1361 ft, Elm Creek 1255 ft, Canyon lime 3597, Conglomerate 5320, Mississippi 5418, Ellenburger 5630, abnd 5682.

Seaboard Oil Co.-Shamrock O&G Corp.'s Speck 1, 440 ft n and 440 ft w of swc McKinney-Williams sur, but in H&TC Ry. 25, blk 44, elev 1588 ft, Elm Creek 1960, Mississippi 6120, Ellenburger 6605, abnd 6633.

Jack County—Failures: Hanlon & Buchanan's Gillespie 2, 233 ft out sec J. B. McNeil sur A-1796, abnd 600.

Hanlon & Buchanan's Briley 2-A, 1633 ft snl and 233 ft ewl B. C. Finley sur A-222, abnd 645.

Wilbarger County—Failure: W. T. Waggoner Est.'s Fee 1-RR, 1200 ft snl and 2600 ft wel H&TC Ry. 2, blk 17, Ellenburger 4557 ft, abnd 4615.

EAST TEXAS WILDCATS

Freestone County—Failure: J. B. Daniel Oil Co.' Inc's Hill 1, 1500 ft snl and 330 ft wel of 100-ac tr, Juan N. Acosta League, elev 324 ft, Pecan chalk 2708, Austin chalk 3832-4163, Woodbine 4517, abnd 4665.

Smith County—Oil Discovery: Humble's T. J. Pool 1, 660 ft out NEc of 243-ac tr and Wm. Saunders sur, 3¾ mi sw of Mount Sylvan, elev 454 ft, Nacatoch 2422, Pecan chalk 3160, Austin 4440-4723, Woodbine 5078, Georgetown 5956, Goodland 7190, Paluxy series 7292, Paluxy oil sand 7339-92, water sand 7416-49, Glen Rose 7634, flowed 522½ bbls 34.6-gr, gas-oil ratio 145/1, tp 400 lbs and cp 460 lbs, natural via ½-in choke from Paluxy perf 7339-52 ft, td 7668.

EAST TEXAS BORDER COUNTIES WILDCAT

Marion County—Oil Discovery: M. A. Freeman's L. Stevenson 1, J. Perry sur, 2 mi nw Jefferson, Travis Peak 6650, perf 48 shots 6495-6507, 2000 gals acid, pump 165 bbls 39.7-gr, gor 860/1, td 7230, pb 6550.

NEW PAY TEST

Panola County—Carthage First Oil Production: Skelly's S. E. Matthews 1, Wm. McFadden sur, 3 mi e Beckville, Rodessa 5636, James 5823-5965, U. Pettit 6093, L. Pettit 6246, Travis Peak 6436, perf 80 shots 6314-30, perf 70 shots 6374-88, 4000 gals acid, pump 170.29 bbls. 29.3-gr oil fr L. Pettit, flow 3,900,000 gas open fr U. Pettit, rock pressure 2605 lbs. td 6715.

SOUTH CENTRAL TEXAS WILDCATS

Bastrop County—Failure: A. J. Stormfeltz' Fitzwilliam Est. 1, 660 fr ely/wl 800 fr sly/sl 400-ac lse, J. M. Bangs sur, Austin chalk 2113, abnd 2302.

Gonzales County—Failure: Quintana Pet. Corp.'s Anna Spahn 1, 350 fr se&nel 344.4 fr nwl 70-ac lse, n½ blk 17, range 5, abnd in Smackover 10,845.

SOUTH CENTRAL TEXAS NEW PAY TEST

Bexar County—Gas Ridge Deep Failure: H. A. Pagenkopf's Max Blum 1, 1320 fr n½wl 400-ac lse, M. F. Rodriguez sur, Edwards li 1363, Glenrose 1770, Travis Peak 3530, completed as fresh wtr well, td 7198, pb 3350.

SOUTHWEST TEXAS WILDCATS

Jim Hogg County—Failure: Panhandle Ref. Co.'s Dave Gallagher 1, 330 fr s&el blk 325, Pippin sbdn 40-ac lse, El Randado Gr, 1½ mi e se Chaparose gas fld, abnd 4070.

Webb County—Failure: Chicago Oil Co.'s A. M. Bruni 1, 660 fr s&el sur 600 on 640-ac lse, abnd 1608.

SOUTHWEST TEXAS NEW PAY TEST

Webb County—N. Albercas Gas Discovery: Blanco Oil Co.-Al Buchanan's A. M. Bruni Est. 5, 765 fr el 100 fr sl blk 28, Brown sbdn Albercas Gr, 480-ac lse, Pettus pay 2520, perf 24 shots 2521-27, flow gas, no gge, sip 650, td 2649.

LOWER TEXAS COAST WILDCATS

Bee County—Distillate Discovery: Bridwell Oil Co.'s Sliva Est. 1, 330 fr ne&nwl 100-ac lse, W cor F. O. Skidmore sur 4, 4½ mi s sw Yougeen gas prod, 3½ mi nw Tynan fld, 7½ mi ne Lucas gas fld, Stillwell pay 4377, perf 60 shots 4378-88, flow 23 bbls. 48.5-gr oil, 7/64-in, gor 300/1, tp 225 lbs, cp 1050 lbs, td 3555.

San Patricio County—Failures: Houser & Campbell's Jose R. Salinas 1, 330 fr se&swl blk 37, Dan Clark sbdn in tr 3, Salinas partn, Santiago de la Garza Porc 110, 80-ac lse, abnd 4008.

Zimmerman & Garcia's M. M. Garcia 2, 330 fr s&el sur 918, D. C. Ainsworth sur, blk 7, 335-ac lse, just w Rincon fld, abnd 3504.

LOWER TEXAS COAST OUTPOST

Bee County—Theis Failure: J. M. O'Melveny Prod. Co.'s Mrs. Ella Quinn 1, 330 fr se&swl 240-ac lse, H. Beckley sur, ¾ mi nw prod, abnd 4425.

UPPER TEXAS COAST WILDCATS

Chambers County — Failure: Windsor Oil Co.'s R. L. White 1, 505 fr wl 1787 fr nl 420-ac lse, T&NO sur sect 74, 1½ mi n Fig Ridge prod, abnd 8520.

Grimes County—Failure: Dean A. Bennett's Sealy-Smith Foundation 1, 330 fr n&el 870.4-ac lse, W. M. McIntyre sur sect 40, abnd 4228.

Wharton County—Failures: Dick Schwab's Cates & Kemp 1, 1300 fr nly/nel 384 se of sec of Phillips C. Cates et al's 25-ac lse, S. F. Austin sur, 2 mi off sw flk Boling Dome, Vicks 7710, abnd 7740.

Salt Dome Oil Corp.'s C. L. Tucker 1, 660 fr s&el 80-ac lse, Mark Weiss sur, sect 24, 3½ mi ne of S. El Campo prod. abnd 7352.

UPPER TEXAS COAST NEW PAY TESTS

Liberty County—McCoy Oil Discovery: Ohio's B. E. Quinn A-2, 1980 fr s&el 1071-ac lse, Daniel Donahoe Lge, 5975 se A-1 dry hole, Quinn pay 9125, perf 24 shots 9125-31, flow 61.57 bbls 32.4-gr oil, 0.5% wtr, ¼-in, gor 385/1, cp 1250 lbs, td 9800.

Matagorda County—Sugar Valley Distillate Discovery: Skelly's B. N. Cocke 1, 417 fr swl 332 fr nwl 55-ac lse, P. Burnett-A. S. Sojourner sur, pay 7674, perf 16 shots 7674-78, flow 8 bbls 52-gr dist, 1,110,000 gas, ¼-in, tp 2825 lbs, td 8400.

CANADA WILDCATS

Alberta Foothills Belt—Stimson Creek Failure: Consumers' Co-operative Refineries' Co-op 1, lsd 11 22-17-2w5, Madison Lime 10,751, water plus show oil and gas in limestone porosity; abnd td 10,923.

Central Alberta Plains — Kinsella Failures: Imperial's Kinsella 8, lsd 11 22-49-11w4; carried Devonian deep test; abnd td 4182.

Imperial's Kinsella 12, lsd 7 -28-48-8w4, abnd td 1985, Viking gas sand yield not commercial.

South Alberta Plains—Pinhorn Failure: McColl-Frontenac Oil & Union Oil's 11B-6-2-8, lsd 11 6-2-8w4, Madison limestone 3230; porosity showed sulphur water; abnd td 3303.

Irvine—Gas Discovery: California-Standard's Irvine-Province No. 28-32-11-2, lsd 16 32-11-2w4; td 3375 ft, in top of Madison limestone; lime and overlying Basal Lower Cretaceous and Jurassic sands water bearing; gas 330,000 cu ft daily on drill-stem test from Medicine Hat sand (Upper Creatceous) 1400.

Barges For Sale

Bids for the purchase of 30 barges converted into tank barges in 1943 by the Defense Plant Corporation have been invited by the Maritime Commission, to be opened May 29.

The offering includes two 132-foot and 28 175-foot barges, now tied up at Palatka, Florida, and Logtown and Pearlington, Mississippi. A minimum price of $7500 has been placed on one of the 132-foot barges, and $5000 on all the others.

The OIL WEEKLY'S TRADING POST

USED EQUIPMENT FORUM

CLASSIFIED ADS . . . EQUIPMENT . . . SERVICES . . . PERSONNEL

FOR SALE

FOR SALE: Lehmann oil country type hollow spindle lathe with 10½ inch hole, length of bed 35 ft. Price $10,000. Used 3 years. P. O. Box 9305, Houston, Texas.

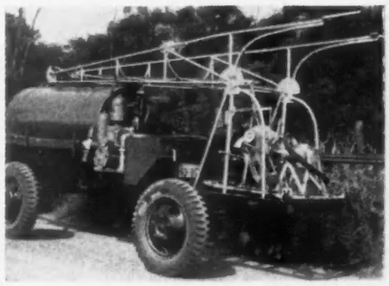
FOR SALE

50— 500 Barrels
10— 1,000 Barrels
20— 5,000 Barrels
4—10,000 Barrels

Heavy A.P.I. New closed bolted type steel tanks now located at Ogden, Utah. Can quote reasonable prices in order to move from present premises at once.

JOS. GREENSPON'S SON PIPE CORP. National Stock Yards, St. Clair County, Ill.

FOR SALE: Two Type A-3, E. L. I. Portable Shot Hole Drills mounted on special 4-wheel trailers with Myers mud pumps, folding derricks, and 250 gallon water tanks. Complete with Briggs and Stratton engines, swivels, kellys, "A" rod, hose, etc., ready to operate. Ideal for 50′ to 100′ holes in swamp areas. Used six months. Good mechanical condition. One drill is complete with take-down derrick, Moyno portable pump, and spare engine. Location—Shreveport. Heiland Exploration Company, 630 Giddens-Lane Building, Shreveport, Louisiana.



FOR SALE

■ Standard Drilling Outfit, complete, A-1, steel rig. New Young 145-hp. engine, new 5000 ft. lines. $8500 or trade for Bucyrus Spudder. L. A. Bolte. Rt. No. 2, Brunswick, Ohio. W. Richfield 2423.

■ FOR SALE: At Aransas Pass, Texas; Three 180 RPM Clark Two Cycle Gas Compressors 16″ x 20″ Power Cylinders and 7¼″ x 20″ Compressor Cylinders, One 5½″ x 20″ Compressor Cylinder Type VS, One 13″ x 20″ Type "S" Double Acting Compressor Cylinder. Condition Very Good. Price $5000.00. Bryant & Saner, Box 107, Kerrville, Texas.

■ FOR SALE—WHY PAY HIGH PRICES FOR DRILLING YOUR SHALLOW WELLS, when you can buy 1 Nat'l D'lg Machine 2A, 50′ shear poles, Ajax 12 x 12 steam engine, 65 HP boiler, drilling and sand lines, 15½″ to 5½″ bits, stems and bailers. Also 2 Sup. Gas Engines, 35 hp, 4 cyc. and 2 Nat'l band wheel powers, pull rods, sucker rods. See Perry Rundell, 5 mi. S. Bryson, Jack Co., Texas.

■ NEW 300 H.P. COMPRESSOR—Immediate shipment, one Clark 300 H.P. Model RA super 2-cycle right angle gas engine driven compressor equipped with two 15″ compressor cylinders 14 x 14 with complete equipment. Brand new, never used. R. H. Armstrong, Box 1191, Texas City, Telephone 1190.

■ RANCH FOR SALE OR TRADE—Six hundred eight acres, short distance from well known Hill Country vacation center. Has about a mile of beautiful river front, a prolific native pecan valley with hundreds of trees; swimming, boating, fishing, deer and game; a recreational paradise. Trade for proven or producing oil royalty. Address owner, 230 East Huisache Street, San Antonio 2, Texas.

HELP WANTED

■ SEISMOGRAPH INTERPRETERS — Large, aggressive, expanding independent producing Company wants two experienced Party Chiefs or Supervisors to do geologic interpretation of reflection seismograph data in West Texas. Permanent job, good salary, housing guaranteed, permanent location. Write giving personal history, education and experience. Your replies will be kept confidential. Our men know of this ad. Box 22, The Oil Weekly, Houston, Texas.

SITUATION WANTED

■ Graduate Petroleum Engineer, Texas University, ex-Army Captain, A.U.S., interested in securing job with progressive oil company. Address: Box 23, c/o The Oil Weekly, Houston, Texas.

POSITION WANTED

■ POSITION WANTED: Veteran, graduate geologists, service experience in electronics. Wants Permanent Location. Address: Box 16, c/o The Oil Weekly.

NOTICES

■ WANTED: Operators to finance and further develop proven and semi-proven oil and gas properties in Montana.

Hamilton & Hamilton, Inc.
Box 1605, 535 Ford Bldg.
Great Falls, Montana.

WILDCAT STARTS

ARKANSAS

Little River County: K. E. Merren's Jas. D. Shaver 1, 36-12s-31w, Glenrose test.

Ouachita County: S. J. Felsenthal's H. H. Medlock 1, se ne sw 29-15s-18w, between Wesson and Gum Crk flds, lcn.

Union County: H. E. Wasson's Union Saw Mill 1-A, (OWDD) sw sw ne 8-18s-12w, otd 2412, ru to deepen.

CALIFORNIA

Kern County: Barnsdall Oil Co.'s Bates 1, 20-25s-19e, Devils Den area, lcn.

Bender Oil Operations' Claire 1, 22-28s-28e, Kern River area, grade.

Beverly Trading and Exploration Co.'s W. P. 1, 30-29s-21e, Temblor area, ru.

L. S. Gilmour & Associates' Tejon 1, 36-32s-29e, Tejon area, lcn.

Richfields' M & L Fee 2, 18-29s-21e, Temblor area, drlg.

Kings County: Pacific Central's Finch 9, 6-24s-23e, Trico area, lcn.

Pacific Central's Finch 10, 1-24s-22e, Trico area, lcn.

Trico Oil and Gas' Chilbers Community 1, 12-24s-22e, Trico area, ru.

Western Gulf's von Glahn 14-8, 8-23s-21e, Dudley Ridge area, grade.

Tehama County: Superior's Russell 1, 12-24n-3w, Corning area, ru.

Santa Barabara County: Union Oil's Escolle A-1, 28-9n-34w, Casmalia area, grade.

ILLINOIS

Clay County: T. Blake Dirickson's Howell 1, se sw sw 9-2n-7e, drlg.

Clinton County: Paul Doran's Thomas 1, nw ne ne 13-2n-1w, lcn.

Coles County: Nation Oil Co.'s Snider 1, nw nw ne 26-14n-10e, drlg.

Edwards County: Burr Lambert's Soucy 1, ne ne se 21-1n-10e, drlg.

Franklin County: Robinson & Puckett's Robinson 1A, nw se nw 13-7s-3e, lcn.

Gallatin County: Dirickson & Liekerneckt's Minor 1A, se ne ne 28-8s-9e, lcn.

Hamilton County: J. J. Lynn's Allen 1, se se sw 12-7s-6e, drlg.

E. S. Adkins' Rubenecker 1, sw se ne 31-3s-6e, drlg.

Richland County: Nash Redwine et al's Hall 1, se se se 16-2n-10e, lcn.

Shelby County: Milo McKittrick's Lewis 1, ne se se 30-10n-4e, lcn.

INDIANA

Gibson County: Texas' Montgomery 1, sw sw ne 21-2s-11w, lcn.

KANSAS

Barber County: Skelly's Boggs "C" 1, sw ne ne 17-33s-12w, lcn.

Ellsworth County: B. & R. Drlg.'s Adams 1, ne ne nw 22-18s-7w, rur.

Ness County: Naxda, Gulf, B. & R. et al's Bowser 1, se se se 7-19s-23w, drlg.

Rooks County: Coralena's Henderson 1, nw nw ne 26-7s-17w, lcn.

Donald T. Ingling's Amos 1, nw nw sw 22-9s-18w, drlg.

Reno County: Cities Service's Johnson "D" 1, nw nw ne 32-22s-9w, rur.

Reno County: H. A. Hershfield's Thompson 1, C w/2 nw ne 20-24s-10w, drlg.

Rush County: Darby & Bothwell's Ficken 1, ne ne se 33-17s-17w, sur.

Trego County: Republic Natural's Hille 1, se se sw 23-15s-24w, drlg.

KENTUCKY

Henderson County: Fisher Oil's Barker 1, 8-0-22, lcn.

NORTH LOUISIANA

De Soto Parish: Delta Drlg. Co.-G. C. Schoonmaker's G. W. Sample 1, (OWDD) 12-13n-14w, otd 3129, to deepen to Travis Peak or 6590.

Richland Parish: H. W. Todd's Greer Est. 2, 13-16n-7e, dr 1385 on Paluxy test.

A. W. Cherry-Barron Kidd's J. J. Archibald Est. 1, ne nw 29-16n-7e, ru Paluxy test.

SOUTH LOUISIANA

E. Baton Rouge Parish: Union Prod. Co.'s East 1, 52-4s-1w, 8000-ft test.

Terrebonne Parish: Texas' Continental Land & Fur Co. 1-A, 660 f&el of swc 10-18s-15e, Copasaw Prospect, 5½ mi s Gibson fld, 13,000-ft test.

MICHIGAN

Allegan County: S. L. Findley's Kayler 1, se ne ne 2-1n-14w, rig.

J. W. Lang Co.'s Gerrit 1, se se sw 5-4n-15w, lcn.

Kent County: Fisher-McCall's Colter 1, sw sw nw 15-10n-12w, dr.

Montcalm County: McClanahan Oil Co.'s Roth 1, se ne sw 24-11n-6w, drlg.

Ogemaw County: Cities Service's Hickey 1, se se se 8-21n-1e, drlg.

MISSISSIPPI

Lincoln County: Roeser & Pendleton's Lincoln Cty. Lbr. Co. 1, ne nw 20-6n-6e, lcn.

Yazoo County: Raines & Carroll's V. Allgood 1, sec ne 11-10n-2w, lcn.

MONTANA

Carbon County: East Elk Basin-Big Horn Basin's Brockway 1, sw ne 19-8s-25e, Warren structure, lcn.

Petroleum County: Farmer's Union Central Exchange, sw sw sw 16-15n-30e, Mosby Dome area, Cat Creek structure, lcn.

NEW MEXICO

Lea County: Chancellor's State 1, c nw se 27-17s-33e, lcn 4900-ft San Andres test.

OKLAHOMA

Creek County: Curtis Oil et al's Culbertson 1, C e/2 e/2 ne 19-17n-8e, mach.

Kay County: E. H. Langston et al's Cumrine 1, ne ne sw 31-25n-1w, lcn.

Lincoln County: Hubble & Webb's Bukaty 1, ne ne ne 19-15n-6e, rur.

Fred Morgan's Polina Cash 1, ne ne sw 6-14n-4e, lcn.

Okfuskee County: Geo. Martin's Metro Trust 1, se sw sw 15-12n-10e.

Pawnee County: Wofford, Nicholson & Rose Drlg. Co.'s Eagle 1, nw sw ne 5-20n-5e, lcn.

Tillman County: Seitz, Comegys & Seitz's Bitner 1, ne ne se 26-4s-16w, drlg.

WEST TEXAS

Dawson County: Homer W. Snowden et al's McKee 1, c nw nw E. L. & RR. Co. 74, blk M, lcn 5000-ft test.

Pecos County: D. R. Cosby et al's Joe C. Trees 1, nw nw se H&GN Ry, 65, blk 8, lcn 2500-ft cable test.

WEST TEXAS OUTPOST

Crane County: Ray Oil Co.'s W. E. Connell 1, c se se PSL 8, blk B-26, 1¼ mi n of Sand Hills field, lcn 4500-ft test.

WEST CENTRAL TEXAS

Coleman County: C. O. Glenn et al's F. Johnson 1, 4275 ft nsl and 330 ft ewl of e½ Buenita Alderate sur 275, lcn 2200-ft rotary test.

Erath County: J. E. Cheek et al's Mrs. Lucy Russell 1, 2316 ft nsl and 990 ft ewl A. Ewing sur, subdiv 6, 2½ mi nw Patillo, lcn 2500-ft cable test.

Jones County: Bailey Balken et al's L. Horn 1, 330 ft out NWc Labor 100, League 126, DeWitt CSL sur, lcn 2750-ft rotary test.

Runnels County: S. H. Davis et al's J. W. Harris 1-B, 695 ft snl and 702 ft wel subdiv 2, or 695 ft snl and 3500 ft wel J. V. Cabrera sur 514, Ellenburger test, dr 820 ft.

Taylor County: S. C. Herring et al's Ida Armstrong 1, 330 ft out NWc Labor 12, League 124, Grimes CSL, lcn 3000-ft Swastika test.

NORTH TEXAS

Baylor County: Chas. E. Morrison Drilling & Prod. Co.'s Richardson 1, 330 ft out nwc B. Gillen sur A-149, lcn 5500-ft test.

Cooke County: Nu-Enamel Oil's J. A. Klement 1, 150 ft wel and 250 ft nsl 100-ac tract, N. Barnett sur A-124, lcn 1300-ft test.

Jack County: Continental Oil's Durham & I. H. Kempner 1, 330 ft n and w of nwc of T. H. Cherryhomes sur A-2034, but in Chas. J. O'Conner sur A-454, lcn 7000-ft Ellenburger test.

Continental Oil's W. H. Heath 1, 330 ft out nec 59-ac tract in w part C. A. Beaty sur A-1358, 5000-ft test, drlg 2070 ft.

Wichita County: Scott Bros. et al's J. L. Jackson 1, 450 ft out nwc blk 16, league 4, Denton CSL, lcn 1200-ft rotary test.

Young County: Lohan Drilling Co.'s F. R. Cotten 1, 330 ft out nwc S.P. Ry. 3, A-266, lcn 3800-ft cable test.

EAST TEXAS

Leon County: Carter-Gragg's J. H. Hammett 1, 1450 ft snl and 475 ft west of Trinity River and on 650-acre lease, Henry Smith sur, lcn 5500-ft Woodbine test.

Limestone County: C. W. Killough et al's Belle Arnet 1-a, 587 ft from ne and 330 ft from se lines 75-ac tr, or 13,100 ft from sw and 1875 ft from se of Pedro Varella sur, 100 ft sw of 5083-ft jkd test.

Navarro County: Jas E. Smith and R. J. Banks' S. S. Skinner 1, 330 ft snl and 5775 ft ewl of Peter Jackson sur, 5 mi se Purdon, 2600-ft test, sp.

SOUTHWEST TEXAS

Duval County: H. H. Howell's Mrs. Lizzie Singer 1, 2970 fr el 475 fr sl 990 fr nl 200-ac lse, e flk of Palangana salt dome, 5000-ft test.

R. M. Reed-R. W. Morgan's First Nat. Bank of Bay City 1, 1650 fr nl 330 fr wl 329.64-ac lse, J. B. Duncan sur 188, 950 ne of dry hole in Peters gas fld area, 3000-ft test.

Starr County: Geo. H. Echols' M. M. Garcia 1-A, 1428 fr wl 2310 fr n; sur 949 on 320-ac lse, 1½ mi w nw of Flo zone prod, 3200-ft test.

Webb County: D. J. Moss' J. O. Walker 1, 990 fr wl 425 fr nl s½ GC&SF sur 264, on 320-ac lse, 2000-ft test.

Slick Oil Co.-Houser & Campbell's L. Moglia 1, 330 fr el 2980 fr sl 2280 fr nl sur 722, on 320-ac lse, 3 mi n Volpe fld, 2700-ft test.

LOWER TEXAS COAST

Bee County: W. C. McBride's L. N. Connally 3, 330 fr nwl 3000 fr nel 690-ac lse, C.C.D.Do. sur, 3100 ne dry hole Connally 2, 4000-ft test.

Producers Corp. of Nevada et al's A. B. & O. H. Wolters 1, 467 ne of Bee-Live Oak Co. line, in Refugio CSL sur 11, 4450-ft test.

Shelby-Walker's J. G. Roundtree 1, 330 fr s&wl H&GNRR sur 194, on 40-ac lse, 1 mi w nw Bridewell's Sliva 1 disc, 4500-ft Vicksburg test.

Calhoun County: Texas et al's State of Tex. 1, 660 fr nl 1980 fr el state tr 106, in Matagorda Bay, on ne ext. of nwl S. Gonzales Gr, 12,000-ft test.

Jackson County: R. N. Ranger's J. H. Tucker Est 1, 330 fr sel 1600 fr nel Tucker Est tr of 300.45-ac lse, John York sur, spud 6500-ft test.

Victoria County: Hiawatha O&G Co.'s Delia Joshua 1, 466 fr nely/ne&sel 1220-ac lse, F. G. Hidalgo sur, 5300-ft test.

UPPER TEXAS COAST

Chambers County: Humble's Double Bayou Unit 2, 660 fr sl 331 fr wl R.O.W. McManus sur, on Mrs. Cora A. Barrow et al 160-ac lse, 11,500-ft test.

Ft. Bend County: Gray Wolfe Co. et al's G. J. Lee 1, 330 fr n&wl 40-ac tr, Wm Pettus sur, Juliff Prospect, 8500-ft test.

Harris County: W. J. Goldston's H. J. Longenbaugh 1, 466 fr nl 644.98-ac lse, 2640 fr wl lse and Geo. Ayers sur, 1 mi nw Gulf's Roberts 1 dry hole, 8000-ft test.

Montgomery County: E. H. Stafford's Fraser-Campbell 1, 660 fr nl 1980 fr el sect 32, J. M. de la Garza sur, 1130-ac lse, Chas. B. Gholson sbdn, 5500-ft test.

WYOMING

Hot Springs County: Pacific Western's Hilliar-Gov't. 35, csl nw ne 35-44n-93w, Zimmerman Butte area, lcn.

Washakie County: General Petroleum's South Fork 88-24-G, 24-46n-92w, Worland area, rurt.

Fremont County: Sinclair Wyoming's No. 1, ne ne nw 35-39-91w, Lysite area, rurt.

CANADA

Central Alberta Plains—Kinsella: Imperial's Kinsella 10, lsd 10 29-49-13w4, coordinates 770 ft N 1985 ft W of NE¼ Sect boundaries; drlg.

Imperial's Kinsella 13, lsd 10 15-46-10w4, coordinates 620 ft N 1850 ft W of NE¼ Sect boundaries; drlg.

Kinsella: Imperial Oil Ltd's Kinsella 12, lsd 7 28-48 8w4, coordinates 2255 ft N 500 ft E; to drill to Viking sand, 2000; drlg.

South Alberta Plains—Princess: California-Standard's Princess-CPR No. 12-22A, lsd 1 22-20-12w4, coordinates 991.1 ft N, 331.25 ft W; ru.

Antelope Valley: Trans-Alberta & Alliance Oils' No. 2, lsd 2 18-20-1w4; ru.

Pinhorn: McColl-Frontenac & Union Oil's 16D-29-1-9, NE lsd 16 29-1-9w4; moving in rig; to drill to Madison lime, 3300 ft.

Central Saskatchewan—Vera Unity: Verbata Petroleum's No. 2, lsd 7 24-41-24w3; drlg. to Cretaceous and Devonian to granite, around 4500.

Bata Petroleum's No. 13, lsd 10 3-39-22w3; drlg to Cretaceous and top 50 ft of Devonian lime, likely td 2300.

Mississippi Lands Leased

Mississippi land reserved for the Choctaw Indian council has been leased to two Jackson oil men, subject to the approval of the Secretary of the Interior. The land comprises 720 acres and has been leased to Cecil Travis, Jackson lawyer, and R. J. Carraway of Jackson and Fort Worth.

SQUEAKS from the BULL WHEEL

Answer to Our Critics

It's tough to find
For love or money,
A joke that's clean
And also funny.

Dark Moment

"There's only one thing wrong with me, blondie. I'm color blind."

"Boss, you sho' is."

Somebody Answer This

"And now," said the instructor in aerodynamics, "are there any questions?"

"Yes, sir. Will you tell me why so many streamlined girls offer a lot of resistance?"

Poet's Nook

In Honolulu I loved a lass
With eyes of brown and skirt of grass;
I thought she loved me, too, you see,
But I was wrong, alack, alas.
She wore a sign that clearly said:
KEEP OFF THE GRASS!

Encore

My current observation
On my last infatuation
Is that "Cupid"
Rhymes with "stupid."

WORLD'S BEST BUY

A PIECE OF TEXAS—

on Houston Ship Channel 70 acre industrial tract; other ideal sites with trackage in the industrial area for plants, supply stores, oil and service company warehouses. Write or call Ralph R. Wallace, 5614 Telephone Road, Houston, Texas. Phone W-92087 or W-92313.

This Curious World

Trouble with most golfers is that they stand too close to the ball—after they hit it.

Every girl wants a husband like an ostrich—one who can see very little and can digest anything.

The old-fashioned girl who was fit as a fiddle now has a daughter who is tight as a drum.

One thing about a wandering glance—it doesn't get slapped.

Definition of jealousy: A friendship between two girls.

Give a woman an inch and she gets the idea she is a ruler.

Hot Air Did It

An overly-inquisitve motorist drew up beside a car parked on a lonely road. "Hey, you two in there! Got motor trouble?"

"Nope."

"Out of gasoline?"

"Nope."

"Tire down?"

"Didn't have to."

When Justice Is Unjust

A lawyer journeyed to a neighboring state to try an important case, promising to wire his partner the moment a decision was announced. At last the wire arrived. "Justice has triumphed!"

The partner indignantly wired back: "Appeal at once!"

The Awakening

"Did anyone ever tell you that your figure is divine, your voice is sweet music, your lips enticing, your hair spun gold and that you have the soul of an angel?"

"No."

"Then where the devil did you get the idea?"

Not Even a Pique

There once was a fellow unique
Who imagined himself quite a shique
But the gals didn't fall
For his line, not at all
'Cause he only made 20 a wique!

Life Is Like This

"Perkins, Parkins, Peckham, and Potts—good morning."

"I want to speak with Mr. Perkins."

"Who's calling, please?"

"Mr. Pincham of Pincham, Pettam, Poppum and Pog."

"Just one moment, please. I'll connect you with Mr. Perkins' office."

"Hello, Mr. Perkins' office."

"I want to speak to Mr. Perkins."

"Mr. Perkins? I'll see if he is in. Who's calling, please?"

"Mr. Pincham."

"Just one moment, Mr. Pincham. Here's Mr. Perkins. Put Mr. Pincham on, please."

"Just one moment, please, I have Mr. Pincham right here. Okay with Perkins, Peckham, and Potts, Mr. Pincham. Go ahead."

"Lo, Joe? How's about lunch?"

"Okay."

"Best Bet Yet"

CLEAN LINES

A clean wire line helps your crew. They can work safer and better on a clean floor, free from drippings. With a Patterson-Ballagh Wire Line Wiper the line is stripped completely of mud and oil. A compact steel housing contains a spiral rubber which is inexpensive and easily replaced. The rubber wipes the line as it comes out of the hole. Sparkproof. Use one on every well. Now made of PBX, Patterson-Ballagh's new synthetic rubber.

See Composite Catalog

Patterson-Ballagh WIRE LINE WIPERS

Los Angeles 1 Houston 10 New York 6

MEN IN THE INDUSTRY NEWS

W. W. WELCH, district land agent at Shreveport for Shell Oil Company, has been transferred to the position of district land agent at Tyler, Texas, replacing **E. C. CASEY,** who resigned April 30 to enter private business. **J. H. HESTERLY,** area land agent at Houston, has been transferred to Shreveport to replace Welch; and **F. J. NICHOLSON,** district land agent in Salisbury, Md., is being moved to Houston to fill Hesterly's position.

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G. RUSSELL SPARENBERG has joined Houston Natural Gas Corporation as a geologist in the production department. He will assist **H. W. CAREY,** production engineer. Sparenberg was in the Navy from 1942 to 1946 and was released with the rank of lieutenant after being cited for meritorious achievement. He received degrees in petroleum geology from the University of Texas and has been employed in Venezuela, Tulsa and Houston.

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PHIL P. GABY, former California supervisor for Geophysical Service, Inc., has joined Standard Oil Company of California as a consulting geophysicist. Gaby, who has worked in California since 1934, is a graduate of Southern Methodist University and did post-graduate work at the University of Texas.

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GEORGE L. PARKHURST has been elected president of Oronite Chemical Company, Standard Oil Company of California subsidiary. He succeeds **R. G. SMITH,** who will continue with Oronite as a member of the board of directors. Prior to the war Parkhurst was with Standard Oil Company (Indiana) for many years.

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J. A. McCARTY and **J. P. COLEMAN,** veteran North Texas producers, have incorporated the Midwest Exploration Company with headquarters at Wichita Falls. The new firm is capitalized at $5000.

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H. D. WILLIAMS, Big Spring district chief production clerk for Continental Oil Company, has been transferred to Midland, Texas, where he succeeds **FELIX ANKELE,** who resigned as chief clerk.

THADDEUS G. BENTON has returned to the general practice of law in New York City at 535 Fifth Avenue and in Washington, D.C., at the Shoreham Building. He recently completed his work as general counsel to the petroleum industry Foreign Operations Committee and the Petroleum Industry Committee (PAW District 1, New York City). Prior to his war work Benton served from 1928 to 1941 variously as vice president and president of Midstates Oil Corporation and vice president and secretary of Middle States Petroleum Corporation, independent crude producers. Previously, he was special assistant to the Attorney General of the United States in income tax and anti-trust matters.

Thaddeus G. Benton

• • •

JOHN O. GALLOWAY, executive vice president of Standard Oil Company of California and chief of that company's operations in Western Canada, has been appointed to a vice presidency of the Alberta Petroleum Association, succeeding **P. F. SHANNON,** former president of Royalite Oil Company and Alberta chief of Imperial Oil operations, who has been transferred to a New York post with Standard Oil Company of New Jersey.

• • •

EDGAR B. YOUNGER, DALAS M. DALE and **ROY D. HENDERSON,** all of Houston, have formed the Interstate Well Service, Inc., with a Texas charter.

• • •

ROSS PIERCE, in the Land Department of the Harper and Turner Oil Company, Oklahoma City, for five years, has been appointed oil and gas agent in the Oklahoma state land office, succeeding **C. W. BOARD,** who resigned last fall.

W. D. (BILL) LANE has been placed in charge of all West Texas operations—geological, land, drilling and production—for Plymouth Oil Company. Lane, with Plymouth for 20 years, heretofore directed only drilling and production in the Permian Basin. **CARLETON D. SPEED, JR.,** Plymouth chief geologist, has resigned, effective June 1, and will be succeeded by **W. W. LaRUE,** chief geophysicist and seismologist for the company.

• • •

J. L. BURKE, traffic manager for Stanolind Pipe Line Company, Tulsa, has been named vice president in charge of traffic.

• • •

CHARLES A. HULL and **G. R. BRAINARD,** both recently released from military service, have rejoined Shell Oil Company as assistant district superintendents in West Texas at McCamey and Odessa, respectively.

• • •

DR. CLARENCE C. SWANSON, professor of Minerology and Petrography at the University of British Columbia, has become chief geologist for Consolidated Mining & Smelting Company of Trail, B. C. Dr. Swanson joined the staff in 1936, and has for several years done geological work for Consolidated.

• • •

TED MILES, manager of foreign operations, Union Oil Company, recently returned to his Los Angeles headquarters following a five-months trip in the Chaco area of Paraguay where he was arranging for the start of drilling operations in the company's first exploratory well in that area. Drilling is scheduled to commence in the latter part of June or early July of this year.

• • •

R. P. HUGGINS, general manager of Western Gulf Oil Company, was honored by his associates on his 25th anniversary with the Gulf organization. A native of Texas, he joined Gulf in the accounting department of the Houston office in 1921. Those in attendance presented him with a gold cigarette lighter decorated with the Gulf emblem symbolic of 25 years' service.

• • •

R. D. BUCK of Schlumberger Well Surveying Corporation in Shawnee, Okla., talked on "Empirical (Qualitative) vs. Mathematical (Quantitative) Methods of Examining Electric Logs," before the Shawness Geological Society May 2. **DELBERT F. SMITH,** Oklahoma Seismograph Corporation, was elected president; **HENRY A. CAMPO,** The Atlantic Refining Company, was named vice president; and **MISS MARCELLE MOUSLEY,** The Atlantic Refining Company, was reelected secretary-treasurer.

• • •

PAUL GRAHAM and **JAMES W. AMYX,** students in the geological and petroleum engineering departments of Texas A. & M. College, won prizes in the Houston Geological Society's Annual Student Award Contest May 6. Two students each from the geological and petroleum engineering departments compete for the awards, which consist of two year paid-up memberships in the American Association of Petroleum Geologists. This competition is conducted by the society' scommittee on student awards and is headed by **R. C. BOWLES.**

• • •

WENDELL THAYER, formerly manager of Wage and Salary administration of Union Oil Company, Los Angeles, has resigned to become secretary-treasurer of the new Pacific Oil Institute. The organization, with offices in Los Angeles, is made up of six of the major oil companies and will compile and distribute to its members information and statistics on labor relations.

• • •

PAUL R. RATLIFF, formerly assistant manager at El Centro in Colombia for Tropical Oil Company, has moved to Bogota where he will be assistant general manager. He will aid **LIONEL W. WIEDEY,** who was recently named general manager for Tropical to succeed **L. P. MAIER.**

• • •

JAMES O. BALL, associate professor of petroleum engineering at the Colorado School of Mines since 1938, has been named head of the new Department of Petroleum Refining Engineering. During the war he worked in cooperation with the U. S. Engineers and the Chemical Welfare Service at the Rocky Mountain Arsenal. For the past two years he has been consulting petroleum engineer with the U. S. Bureau of Mines at Golden, Colo.

• • •

DANA F. DETRICK, Shell Oil Company geologist, has been transferred from Ventura, Calif., to Grand Junction, Colo.

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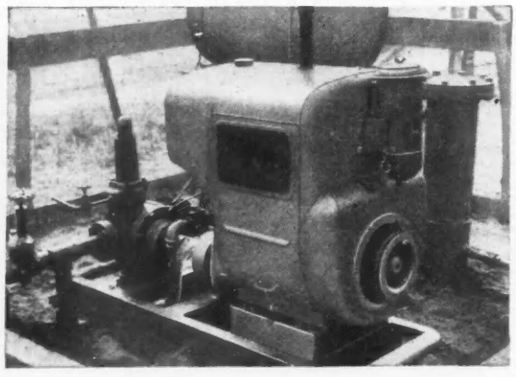

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ARTHUR ABEL has been appointed sales engineer to the staff of the Odessa, Texas, branch of The Cooper-Bessemer Corporation, according to an announcement by Stanley E. Johnson, director of sales. Abel, a graduate of Oklahoma A. & M. College, where he majored in mechanical engineering, was connected with Cooper-Bessemer's Los Angeles office several years ago. **H. E. SCRAGGS** is branch manager of the Odessa office, in charge of Southwest Texas sales operations.

Arthur Abel

• • •

F. S. WEST, A. W. THOMPSON and **H. S. COLE, JR.**, all of Houston, and **THOMAS P. CARR** of Fort Worth have organized the Wescol Oil & Gas Company, with headquarters at Houston. The firm has a capital stock of $30,000, and the owners operate the drilling firm of Thompson & Carr, Inc.

• • •

FORREST DUNLAP, CHARLES L. BRENT and **W. A. HURLEY**, all of Dallas, have incorporated the Seven Lakes Oil Corporation, with headquarters at Dallas.

• • •

FRANK J. GRAVIS, H. J. GRAVIS, M. L. WEST and **T. H. PHILLIPS**, all of San Antonio, have incorporated the Wise Drilling Company, with capital stock of $50,000.

• • •

W. L. ALBERT, Winchester, Ky., has retired as district manager of The National Supply Company and will make his home at Winchester. Albert joined Oil Well Supply Company in 1893 and in 1903 quit to join the National Supply Company at Lima, Ohio.

• • •

E. J. VAN DYK has been appointed petroleum industry field engineer and district manager of sales for the Detroit diesel engine division of General Motors Corporation. He will make his headquarters in Tulsa and his district will include Oklahoma, Kansas, and Illinois.

• • •

W. C. (CASEY) JONES, after 1½ years in the contracting business in Texas, has rejoined the sales staff of Security Engineering Company, Inc., as district manager of the Houston division with officers in the Mellie Esperson Building, Houston. Jones first joined Security's sales staff in 1939. After working California from both the Whittier and Bakersfield offices he was transferred to Texas, where he covered the fields of South Texas, East Texas and Louisiana.

• • •

H. C. ANDERSON, formerly with The Flintkote Company, Chrysler Corporation, and Ford Motor Company in research, engineering and managerial capacities, has been appointed director of research for Thermoid Company.

• • •

H. S. DERSHIMER, for the past ten years district sales manager of the Tulsa office for Babcock & Wilcox Tube Company, has been made assistant sales manager of the Mid-Continent district for Pittsburgh Steel Company with headquarters in Tulsa.

• • •

BEST DAWSON, manager of domestic and foreign sales for Oil Well Manufacturing Corporation, Los Angeles, is on a business trip through oil production areas in Mexico, Peru, Ecuador, Colombia, Venezuela, Trinidad, Haiti and Cuba. He will return in the latter part of August or early September.

• • •

JOHN L. P. CAMPBELL, Gulf Coast division radioactivity engineer for Lane-Wells Company, discussed "Some Practical Aspects of Radioactivity Well Logging" before the Mid-Continent Section, American Institute of Mining and Metallurgical Engineers, Tulsa.

• • •

GERHARD M. DAHL, former banker and chairman of the Brooklyn-Manhattan Transit Company, succeeded **SERGE RUBINSTEIN** upon his retirement as chairman and president of Panhandle Producing and Refining Company. Dahl, at one time vice president and director of Chase National Bank, joined the oil concern when he was named a director.

A. C. WIMMER, treasurer of Oil Well Supply Company, ended 30 years of association with the company when he resigned April 30. He joined Oil Well in 1916 and his service was interrupted only by his participation in the first World War. In 1932 he was made credit manager of the company's Midwest Division and later appointed assistant treasurer. He has been a treasurer and a director since 1940. **G. F. GOETZINGER**, associated with Oil Well Supply for 32 years, and formerly assistant treasurer, will become treasurer. He started with Oil Well as a stenographer at Pittsburgh in 1914, later became a credit clerk, and has been in credit work continuously except for two years after his return from World War I, when he was secretary to the company's president. After 12 years as credit manager in the Eastern Division, he became assistant treasurer and general credit manager in 1944 at the company's headquarters in Dallas.

• • •

LT. BILL LARSON, just released from the Army, has joined his father in the A. D. Larson Supply Company, Oklahoma City.

• • •

M. G. McFALL and **W. H. SEYFERT, JR.**, are in charge of the new Oil Lift Supply Company Mid-Continent division office in Oklahoma City.

• • •

H. R. LAMBERTH, formerly sales manager for Fluor Corporation and who has done some special oil work in Mexico, has joined the Joseph A. Coy Company, Inc., Tulsa, as special sales engineer.

• • •

R. S. DURKEE, president of Lane-Wells Company, Los Angeles, headed a group of Lane-Wells officials visiting the Tulsa offices of the company during the annual meeting of the Petroleum Equipment Suppliers Association. **J. D. HUGHES**, general sales manager of the company, Los Angeles; **R. B. McCULLAR**, division manager of the Mid-Continent area, Oklahoma City; **R. B. DOWNING**, sales manager for the Mid-Continent area; and **J. C. BARCKLOW**, company geologist, Dallas, were the other Lane-Wells officials in Tulsa.

• • •

G. G. (TUFFY) GRIFFIS has become a partner in the Holland Construction Company. Griffis has spent 25 years in the pipe line construction business throughout the world, principally in South America and Alaska. He was recently director of the Canol Project in Alaska.

• • •

T. F. BRAWNER, former Beaumont newspaperman, has joined The Texas Company as public relations representative with headquarters in Houston.

L. R. PAGE has been appointed a representative for Franks Manufacturing Corporation of Tulsa in Arkansas, Louisiana, Mississippi, Alabama, Georgia and Florida, with headquarters at Jackson, Miss. Following graduation from Princeton with a B.S. degree, and after two years in the Navy in World War I, he moved to Tulsa in 1920 to become a roustabout for the Orlean Petroleum Company in the Bristow field. He was later chief scout for the firm in Kansas and Oklahoma. His next oil venture was to organize his own drilling company and oil company.

L. R. Page

• • •

WOODROW DICKSON has rejoined the Tretolite Company of California after 2½ years with the Army Air Forces. He will be stationed in the research laboratory at Los Angeles. **CARL COOPER**, after 2½ years in the Army Air Forces, one of which was in Italy, will resume his duties with the research division of Tretolite. **IRVING OSBURN** is back in the field engineering department of Tretolite after three years in the Army Paratroops. **LYMAN CRALLE**, after more than three years service with the Army Air Forces, has returned to the manufacturing department of Tretolite.

• • •

GEORGE W. COCKE, former district manager in Oklahoma for Erie Meter Systems, Inc., for 13 years, has joined Bowser, Inc., as representative in the Tulsa area. He will handle sales of marketing equipment and Petinco systems to the major oil companies in that territory under the Boswer Dallas district office, and will make his headquarters in Tulsa. A native of Virginia and a graduate of Virginia Polytechnic Institute, he was in the Army during World War I and received the Purple Heart and the Silver Star. The seven years following the war he spent in the metals industry in Kentucky, and before joining Erie in 1933, he was also in the paint, gasoline and oil industries in the Southwest.

• • •

GILBERT A. PARKS, recently released from the Eighth Air Force after three years of active duty, has been appointed assistant-division engineer of Core Laboratories, Inc.'s Rocky Mountain Division. He received his degree in petroleum engineering from the University of Texas in 1939 and went directly to Core.

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MEN IN THE INDUSTRY NEWS

J. W. BATES and **C. C. BATES** of Tulsa and **G. M. READING** and **V. D. READING** of Odessa, Texas, have incorporated Bates-Reading Drilling Company, with a capital stock of $40,000. Texas headquarters will be at Odessa. An office is maintained in the Philtower Building, Tulsa.

* * *

N. B. NICHOLS, for four years associated with Radiation Laboratory, a subsidiary of the Massachusetts Institute of Technology, has been appointed director of Taylor Instrument Company's research division to succeed **DR. H. L. MASON,** who resigned to accept a professorship of mechanical engineering at Iowa State College. After completing his undergraduate studies at Central Michigan College of Education, Nichols spent three years of graduate work in physics at the University of Michigan. Before the war, he spent two years with the Taylor Research division.

* * *

BRUCE H. BEESLEY, recently discharged from the Army with the rank of captain, has been named sales and service engineer for Eastman Oil Well Survey Company in North and East Texas. Prior to entering the Army, he held a similar position in the Oklahoma area. His wartime service includes duty in Hawaii, New Guinea, and Japanese Intelligence in Washington, D. C. He was awarded the Bronze Star for Valor and the Asiatic Pacific ribbon with four battle stars. His headquarters will be in Dalas.

* * *

BOWMAN THOMAS, chief production engineer for Humble Oil & Refining Company, addressed the Student Section, AIME, University of Texas, Austin, on petroleum engineering problems in the development and producing branches of the industry.

* * *

PATRICK H. DOWNING of Freer, Texas, and **W. F. WALLACE** and **HOSKELL SOBEL** of Corpus Christi, Texas, have incorporated the Downing Oil Company with $25,000 capital stock. Headquarters are at Corpus Christi.

* * *

J. D. SWARTZ, district representative for South Chester Tube Company in Tulsa, has been promoted to manager of sales, Mid-Continent district, including Oklahoma, Kansas and Illinois. He will continue to make headquarters in Tulsa with branch office in Wichita, Kansas. He also will be manager of sales of South Chester Corporation, a recently organized subsidiary.

* * *

WILLIAM E. STILES, for two years in the engineering department of Core Laboratories, Inc., Dallas, has been appointed division engineer of the North and West Texas, Oklahoma and Kansas Divisions. He received his degree in petroleum engineering from Texas A. & M. College and joined Core in 1942 as a field engineer.

* * *

GLEN M. SIMMS, formerly with Dunlap Bit Company in the San Joaquin Valley area, now is Southern California representative for the company handling Los Angeles Basin and Coastal fields. **ED ABBOTT, JR.,** who recently returned from the Navy, has been San Joaquin Valley representative for the company since the first of the year. His headquarters are in Bakersfield. Prior to entering the Navy, Abbott was with Hughes Tool Company in the San Joaquin Valley area.

* * *

WALTER H. (TEX) RITTERBUSCH, JR., recently discharged from the Army Air Corps after three years as an aircraft engineering officer, has joined The S. M. Jones Company. He is the latest member of the field engineering staff organized by Jones to analyze wells, record sucker rod service and confer and cooperate with production engineers to improve pumping conditions. He holds a B.S. degree in petroleum engineering from the University of Tulsa.

* * *

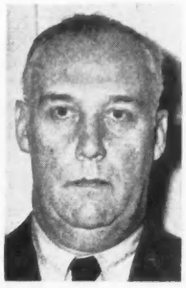
W. R. WHEELER, JR., formerly in the sales department of the American Iron & Machine Works Company, has resigned to accept a position as manager of the M-C-M Machine Works of Oklahoma City. Wheeler has been succeeded at the American Iron & Machine Works Company by **ELMER E. RUBAC,** a former employe of American who has just been released from the Army.

* * *

CHARLES U. S. GRANT, recently released from the Navy after more than three years of service, has been appointed sales engineer for Foote Brothers Gear and Machine Corporation at the company's Cleveland office. He attended Ohio and Western Reserve Universities, and prior to his enlistment in the Navy in 1942, he had 15 years' experience in the power transmission field.

Deaths

HAROLD D. CRAWFORD, 51, president of the Maloney-Crawford Tank and Manufacturing Company, Tulsa, died May 5. Crawford formed the Crawford Tank and Supply Company at Tulsa in 1943 and in 1945 bought the controlling interest in the Maloney Tank and Supply Manufacturing Company, Tulsa, and merged the two firms into the Maloney-Crawford company. Crawford was the son of the late David Crawford of Parkersburg, W. Va., who with his brother, John Crawford, established the Parkersburg Rig and Reel Company.


Harold D. Crawford

* * *

JAMES E. McCLELLAND, 70, an official of the Sinclair Prairie Pipe Line Company, died May 4 at an Independence, Kansas, hospital. He was a native of Ohio.

* * *

JOHN N. DEMOREST, 63, independent oil and gas operator, died May 7 in Tulsa of a heart attack. A native of Erie, Pa., Demorest moved to Tulsa in 1918 and was associated with Westcott and Greis and later with Chestnut and Smith before going in business for himself in 1930.

* * *

A. D. RILEY, 48, superintendent of the East Texas-Louisiana Division, The Texas Pipe Line Company, died at Lafayette, La., May 3. He entered the employ of the company September 8, 1920, at Weatherford, Texas. After service in the Mexia area, he was transferred to the East Texas division and became assistant superintendent in 1934 and superintendent in April, 1940.

* * *

CHARLES V. C. BRADLEY, 75, former general field superintendent for Magnolia Petroleum Company, died April 27 in Little Rock after an illness of two years. Bradley was one of the pioneers in Pennsylvania, Ohio and West Virginia fields and later was production foreman for South Penn Oil Company. He moved to Texas in 1919 and was employed by Magnolia until his retirement in 1936.

THE OIL MAN'S CALENDAR

MAY	
17–18	**Southwestern District, Production Division, API, Spring Meeting, Shreveport, La., Washington-Youree Hotel.**
23–25	**National Oil Scouts and Landmen's Association, Annual Convention, Jackson, Mississippi, Hotel Heidelberg.**
28–29	**American Petroleum Institute, Directors' Meeting, Fort Worth, Blackstone Hotel.**
JUNE	
6– 7	**Mid-Continent District, Production Division, API, Spring Meeting, Oklahoma City, Skirvin Hotel.**
7– 8	**Kentucky Oil and Gas Association, Lexington, Ky., Hotel Lafayette.**
13–14	**Eastern District, Production Division API, Spring Meeting, Pittsburgh, Pa., William Penn Hotel.**
17	**FPC Gas Hearing, Washington, D.C. Court of Appeals, 5th and E.**
27–28	**Pennsylvania Grade Crude Oil Association, Annual Meeting, Pittsburgh, William Penn Hotel.**
AUG.	
8–9–10	**Interstate Oil Compact Commission, Quarterly Meeting, Grand Rapids, Michigan, Pantlind Hotel.**
OCT.	
7–12	**American Gas Association, Annual Convention, Atlantic City, N.J.**
16–18	**Texas Mid-Continent Oil and Gas Association, Houston, Rice Hotel.**
NOV.	
11–14	**American Petroleum Institute, Annual Meeting, Chicago, Stevens Hotel.**

Two Sales Engineers Are Added To Staff of Lane-Wells Company

George S. Flanders has joined Lane-Wells Company, Houston, as export sales engineer, according to Jas. D. Hughes, sales manager, and James C. Wright has returned from military leave of absence to become district sales engineer in Houma, La.

Flanders was active in oil tool export work before the war and had headquarters in Trinidad and New York City. During the war he was stationed in England, where he helped plan the pipe line system for the European invasion. His headquarters will be in Los Angeles.

Wright was recently released from the Army Air Forces after four years of service in the European, African, Burma and China theaters.

Otis Offers Corrosion Survey Service by Agreement with Sun

Otis Pressure Control, Inc., through an arrangement with Sun Oil Company, has been granted exclusive license to provide a corrosion survey service for internal inspection of well tubing by use of a new instrument to be called the "Otis Tubing Caliper."

Developed by petroleum engineers of Sun Oil Company, the tubing caliper consists of six or eight arms which make contact with the inner wall surface. A record is made of the movement of these arms in such a manner to indicate the minimum wall thickness and not the average wall thickness. Otis service crews, consisting of an engineer and a wire line specialist will run the tubing caliper.

Houston Oil Field Material Announces Personnel Changes

Paul Antoine, formerly a field representative for Houston Oil Field Material Company, Gulf Coast area, has been appointed city salesman for the Houston area. He will be replaced in the field by Ray Chambliss, formerly in the Houston store. Jack O'Neil has been transferred from the HOMCO Mud and Chemical Department in Odessa, Texas, to New Iberia, La., where he will serve in the same department. Jack Stone will succeed O'Neil at Odessa. Joe Lawrence, recently released from the Army, where he held the rank of captain, has returned to HOMCO and has been assigned to the Victoria, Texas, area. Before entering the service, he worked in HOMCO's Houston office.

Sterling Buys Manufacturing Rights to High-Speed Diesels

The National Supply Company of Pittsburgh and Sterling Engine Company of Buffalo announce that the latter company has purchased the manufacturing and servicing rights to the high-speed diesel engines formerly produced at National's Superior Engine Division, Springfield, Ohio. Production of the engines will be taken over by Sterling as soon as tools and inventory can be transferred from Springfield to Buffalo. Disposal of the company's rights to the high-speed diesels will permit National to expand its facilities for the production of slow-speed, heavy duty diesels suitable for the petroleum industry, larger marine-type installations, stationary power plants and commercial applications.

U. S. Steel Bids on Government Steel Plant at Geneva, Utah

Benjamin F. Fairless, president of United States Steel Corporation, announced that in response to specific requests made by representatives of the government, his firm has submitted a bid to the War Assets Administration to purchase the government-owned steel plant at Geneva, Utah, and inventories for $47½ million in cash. In the event of the acceptance of such bid, U. S. Steel would further obligate itself to spend not less than $18,600,000 additional of its own funds for the installation at Geneva of additional facilities necessary for the peacetime operation of the plant.

Fairless stated that under the proposal of U. S. Steel these additional facilities at Geneva would include equipment for the annual production of 386,000 tons of hot rolled coils, which would be utilized in the production of cold reduced sheets and tin plate at a modern cold reduction mill to be erected by Colombia Steel Company, a subsidiary, at Pittsburg, Calif., at an estimated cost of $25 million.

Waynesburg Tool Concern Bought By National Supply Company

The National Supply Company has purchased Waynesburg Tool Company at Waynesburg, Pa. The company took over May 1 with Edward L. Hollobough as store manager. The store was originally owned by the Prichard Supply Company, and more lately was operated by Donnelly and Wilson.

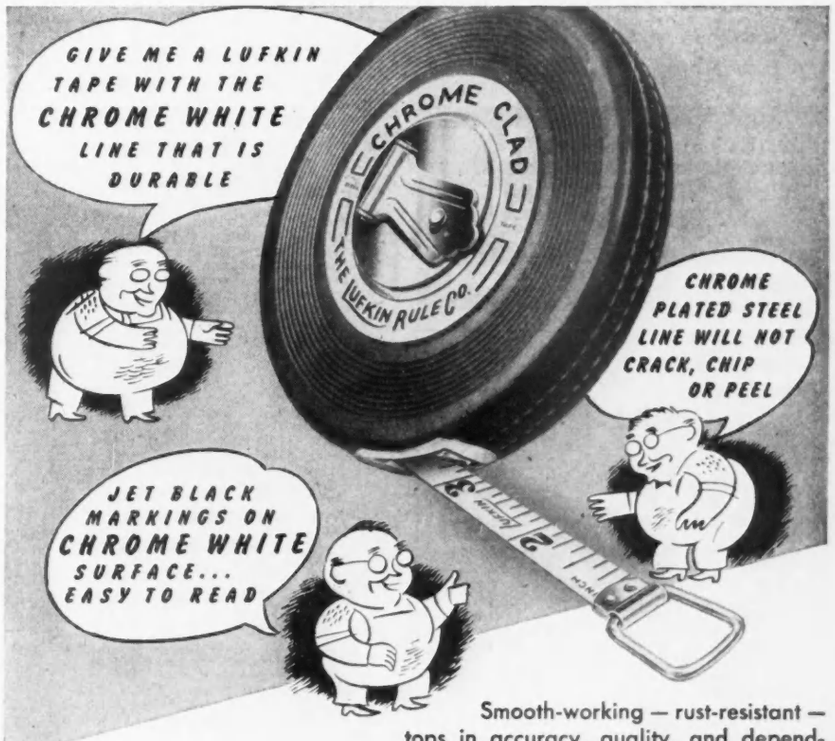
Hollobough was formerly manager for Prichard Supply and later for Donnelly and Wilson.

American Car and Foundry Plans To Extend Valves Production

American Car and Foundry Company will extend production of ACF lubricated plug valves to include cast steel valves in series 100 and 300 in sizes ½ inch to eight inches. These valves will be particularly adapted for high pressures and temperatures such as requirements found in oil field production work, process plant application, refining installations where external fire hazard prevails, and on any service where cast steel valves are specified.

Bowser Representative Named

Robert L. Ledbetter has been appointed supervisor of oil field equipment sales with headquarters in Dallas, according to Fred C. Farmer, manager, Meter Sales Division, Bowser, Inc., Fort Wayne, Ind.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PETROLEUM REGISTER

The PETROLEUM REGISTER, national and international oil directory, recently issued its 24th Annual Edition, a complete revised record of all branches of the industry with detailed data on Producers, Drilling Contractors, Refiners, Pipe Lines, Marketers and Jobbers, Natural Gasoline Mfrs., etc.

Recent advertisements of the MIDWEST OIL REGISTER in oil journals has caused confusion among many in the industry, who, noting the similarity in names, believe it to be connected in some way with the PETROLEUM REGISTER.

THERE IS ABSOLUTELY NO CONNECTION WHATSOEVER BETWEEN THE TWO PUBLICATIONS.

The PETROLEUM REGISTER, pioneer directory of the oil and gas industry, was established in 1918. It sells for only $10.00 a copy postpaid.

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